

TRIAL EXHIBIT 2237

(PART 2 OF 3)

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conjunction with broader commercial agreements that permit the use of Sun intellectual property and services in addition to the use of the TCK. These agreements – typically either a TLDA or a SCSL agreement – are to commercial entities with the TCK delivered as part of a “bundled” package along with Sun’s implementations and support (“Bundled License”). The Bundled License essentially provides four things to licensees: (i) a license to the IP rights that are licensable by the Specification Lead and needed to implement the Specification; (ii) the right *to use and extend* the Source Code of the Reference Implementation of the Specification; (iii) a license to the TCK suite to certify compliance with a particular Java Specification; and (iv) the ability to market and sell the licensees’ product as compliant with a particular Java specification—*e.g.*, Java SE or Java EE.

Sun also offers ‘standalone’ TCK licenses for vendors that wish to develop an independent implementation of the relevant Java specification (that is, for those who do not have a need to license Sun intellectual property other than for the narrow purpose of testing their implementation against the Specification). These “standalone” TCK licenses are offered for free to not-for-profits and the majority of the standalone TCK licensees are, in fact, not-for-profit entities. A licensee must use the appropriate TCK to certify itself that its offerings are compliant with the applicable specification. Sun has rights to audit such self-certifications but uses these only very rarely. Any implementation that is not certified as compliant does not have the right to relevant IP from Sun, such as patent, copyright and trade marks, including the right to call the product Java-compliant.⁴³

- **License availability.** Sun is not aware of any instances where Sun has refused to license any of the Java technologies. As discussed below, Sun’s licences impose restrictions relating to compatibility requirements and can incorporate field of use provisions to allow Sun to satisfy its obligations under the JSPA to ensure uniformity of the Java implementation for each distinct Java environment.⁴⁴ For

⁴³ Google Android is not an example of this situation: Google has not sought a licence from Sun because the implementation is not – and is not designed to be – compliant with the relevant TCK.

⁴⁴ Field of use restrictions are recognised as a means of efficiently licensing a single product to a highly varied customer set, see for example the Technology Transfer Block Exemption Art. 4(1)(c)(ii) and the accompanying guidelines (in particular para.182), which recognise that such restrictions can be pro-competitive by encouraging the licensor to license its technology for applications falling outside its own main area of focus.

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example, one cannot take a license to Java SE for use in a mobile device since Java SE and Java ME are not compatible. Presently, vendors of mobile Java applications can be certain that Java ME – and only Java ME – will be installed on a Java-enabled mobile device. The vendor can thus write its application once and run it on every Java mobile device. If some mobile devices were to migrate to Java SE instead, the standard (along with Sun's ability to charge for Java ME) would be compromised.

- **Licensing revenues.** Sun generates revenue from (*i.e.*, "monetizes") Java through four platform technologies: Java EE, Java SE, Java ME, and Java Card. Pricing varies per platform but essentially includes (1) Licensing; (2) Engineering Services; and (3) JLE - optional support services.

The Java technology family is used in thousands of different applications. In each case, the licensee is not required to disclose to Sun the end price of the software, which is running Java. As a result of this, and given the highly differentiated pricing, usage and customer bases of software companies that use Java, it is nearly impossible for Sun to meaningfully estimate the cost of Java licenses for a particular software company as a proportion of the total price of the software for which those Java licenses are necessary.

Set out below, however, are some illustrative examples of the wide divergence between various software companies' total costs of Java licenses as a proportion of those companies' total software revenue.⁴⁵ In every case, the proportion of total Java licensing costs as against total software revenues is de minimis:

- **IBM.** IBM paid Sun an aggregate of USD 12.2 million for Java licensing in FY08 and reported total software license revenues of USD 22.1 billion, making IBM's total Java licensing costs less than 0.1% of IBM's total software revenues. Out of this total amount, IBM's Java-based middleware total revenue was USD 17.3 billion.
- **Oracle.** Oracle paid Sun USD 4.6 million for Java licensing in FY08 and reported total software license revenues of USD 7.5 billion, making Oracle's total Java licensing costs less than 0.1% of Oracle's total software revenues.

⁴⁵ Annex 25 includes a list of Java licensees which are competitors to Oracle.

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- **Hewlett Packard.** Hewlett Packard paid Sun USD 2.6 million for Java licensing in FY08 and reported total software license revenues of USD 3 billion, making Hewlett Packard's total Java licensing costs less than 0.1% of Hewlett Packard's total software revenues.
- **Sybase.** Sybase paid Sun USD 1.5 million for Java licensing in FY08 and reported total software license revenues of USD 0.4 billion, making Sybase's total Java licensing costs less than 0.4% of Sybase's total software revenues.
- **SAP.** SAP paid Sun USD 0.9 million for Java licensing in FY08 and reported total software license revenue of USD 8.4 billion, making SAP's total Java licensing costs 0.1% of SAP's total software revenues.
- **Red Hat.** Red Hat paid Sun USD 0.2 million for Java licensing in FY08 and reported total software license revenue of USD 0.5 billion, making Red Hat's total Java licensing costs less than 0.1% of Red Hat's total software revenues.

With regards to duration, licensing agreements are typically for a period of one to ten years. For example, Sun and IBM are parties to a Technology License and Distribution Agreement that began in October, 1996 and is currently set to expire in October 2016. IBM has a yearly option to terminate the agreement upon adequate notice; Sun may only terminate for cause, and even after the expiration of the current term in 2016 IBM may compel Sun to extend the agreement for additional terms subject to agreement between the parties about the then-current fees, where IBM is protected by a "most favoured nation" clause. The agreement covers a very broad set of Java technologies, and IBM pays Sun an annual fee in consideration for the license rights and support services provided by Sun. The agreement has no field of use provision.

Sun has no current contractual relationship with Microsoft for Java technology, with the following two caveats:

- First, Microsoft has enjoyed limited rights to distribute a binary version of the JRE for use on Windows platforms. This license terminated as of June 30, 2009, except that Sun and Microsoft have agreed that MS may enjoy a limited, six month extension with respect to supporting one specific customer; and

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- Second, in 2008 Microsoft acquired a Java ME (MIDP and CLDC) SCSL licensee named Danger, and Sun consented to the assignment of this agreement to Microsoft. As best Sun can tell, Microsoft has continued to operate Danger's business in the same manner as prior to the acquisition.

105. **Servers.** Sun also offers server hardware:

- **Sun Blade Systems:** Modular blade servers with multiprocessor and OS support.
- **Sun CoolThreads Servers:** marketed as offering the highest throughput and breakthrough eco-efficiency.
- **Sun x64 Servers:** AMD- or Intel-based servers, also known as x86/x64-based systems, running the Solaris OS, Windows, Linux and VMware.
- **Sun Netra Carrier-grade Servers:** "ruggedised" servers and software designed for demanding applications and conditions.
- **Sun Entry Rackmount Servers:** entry-level budget rackmount servers.
- **Sun Midrange to High-end Servers:** Designed for 24/7 mission-critical computing, backed by enterprise-class features and mainframe-class remote access servers.

Oracle currently does not sell any hardware, although it does offer hardware/software solutions in partnerships with OEMs such as Hewlett-Packard and Dell (e.g., the HP Oracle Database Machine).

106. **Central processing units.** Sun provides the SPARC CPU.

107. **Storage.** Sun provides Sun Storage disk-based storage solutions and Sun StorageTek tape-based storage solutions.

108. **IT Services.** Both Oracle and Sun provide IT services associated with their products. They do not provide IT consulting or other services independently of their own product offerings. IBM Global Services, Accenture, Hewlett-Packard, Infosys, Wipro, and BearingPoint are the major services firms. Obviously, these services firms play a major role in the choice of software systems through their role as systems integrators.

C. "AFFECTED RELEVANT MARKETS"

109. **Challenges of market definition in enterprise software.** Market definition in the software space is not straightforward, owing to the wide range of products and functionalities in the space and the different approaches taken by vendors

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to packaging and marketing their offerings, including the decision by some vendors (particularly Microsoft) to embed certain functionalities (e.g., middleware components) within its other offerings (e.g., operating systems). This leads to fluid and partially overlapping alternative product segmentations. As discussed below in the context of market shares, such difficulties are reflected in the different approaches to market segmentation taken by the leading analyst firms. While a narrow view of demand-side substitution considerations could in theory lead to the definition of markets by reference to particular functionalities, this would not reflect the market realities, in particular that (a) there may be alternative technical solutions to the same business problem and (b) the products offered by vendors do not map neatly to individual functionalities, but rather consist of varying mixes of related or complementary functionalities.

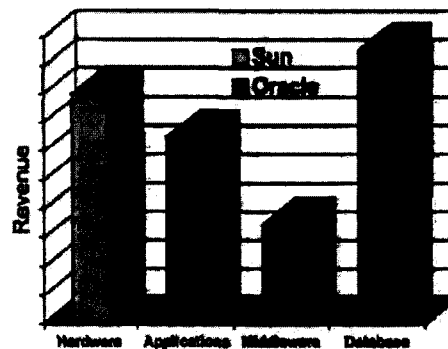
110. *Analysts' markets are used as a (flawed) proxy.* In the Parties' view, however, nothing turns on the market definitions adopted for the purposes of assessing the Transaction. On any view of market definition, the analysis of competitive realities leads to the conclusion that there are and will remain numerous strong competitors to the Parties in all the areas where there is overlap, and that there will be no significant loss of competition in respect of any product or set of products. Purely as a pragmatic approach, in order to be able to draw on available third-party market data, the Parties have chosen to use market analyst IDC's existing segmentation as a basis for identifying affected "markets" and estimating shares of those "markets." In particular, IDC reports on the following segments potentially relevant to this Transaction:

- Databases;
- Development Environments;
- Application Server Middleware, including TPM and web servers;
- Identity and Access Management;
- Integration and Process Automation Middleware, including ESB, BPMS, event driven middleware, B2B middleware and connectivity middleware;
- Enterprise Portals;
- Collaboration Applications;
- Virtualisation Software;
- Servers;

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- CPUs; and
 - Storage.
111. These segmentations and their shortcomings are described in more detail below. While the Parties do not necessarily consider those segmentations to correspond fully to relevant markets in the sense of EC competition law, they nevertheless believe that they serve as a reasonable practical starting point for an assessment of the Transaction, subject to the important limitations described below in paragraphs 85 *et seq.*
112. **Horizontal overlaps.** The parties' offerings are highly complementary, with Sun's strengths focused on hardware and operating systems, and Oracle's on databases, middleware and applications.

Figure 1: Oracle/Sun revenues across the stack



113. Following IDC's segmentation, Oracle's and Sun's offerings specifically overlap (nominally at least)⁴⁶ in the areas of:
- Databases;
 - Server OS;
 - The following segments of middleware:

⁴⁶ As also noted below in the context of the discussion of affected markets, the Parties' products may nominally provide functionality of the same nature while in practice offering very different features and addressing different user needs.

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- Application Server Middleware (including TPM and web servers);
 - Enterprise Portals;
 - Integration and Process Automation middleware, in particular:
 - Events-based middleware;
 - ESB (including message-oriented middleware);
 - BPMS;
 - BAM;
 - Collaboration applications;
 - Virtualisation software (IDC's "Virtual Machine Software").
114. Based on IDC market data, databases, application servers ("Application Server Middleware"), ESB ("ESB and MoM"), BPMS ("Process Automation Middleware"), and Portals ("Enterprise Portals") are potentially horizontally affected markets for the purpose of this Form CO.⁴⁷ For completeness, however, the table below includes all middleware categories in which the parties have a nominal overlap.

⁴⁷ While leaving the market definition open, the EC has in Case COMP M.5080 *Oracle/BEA* conducted its review on the basis of the analysts' segmentation with regards to the relevant affected markets in that case (application servers, portals, application integration middleware and ESB). Similarly in Case COMP M.4747 *IBM/Telelogic*, the EC also followed analyst segmentation.

[illegible]

10. *Journal of the American Medical Association*, 2000; 283: 2669-2675.

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database, however, is designed for implementations where security, reliability and vertical scalability are paramount. Implementation and maintenance of an Oracle database is highly complicated, as the database is deployed where transaction integrity, high data volumes, compliance and archiving become relevant (e.g., enterprise financial/accounting systems).

MySQL, while useful as a horizontally scaled web application database, has very little to offer an application that requires transactional integrity, high volumes, compliance, archiving, high reliability, and a large shared memory space. These capabilities are a deep, intrinsic aspect of the Oracle Database implementation, and would necessarily be an essential part of any database system that provided them. It's unlikely that a customer would be willing to make the huge engineering investment required to give MySQL these capabilities. Some customers do have applications, which require larger overall scale, but don't require absolute reliability or integrity. In those cases, it is feasible to use software engineering resources to structure the application such that the application can use multiple MySQL databases running on multiple servers at once to satisfy the application's scale requirement (so-called 'horizontal scaling'). Some web companies have done this, for example, where their specific application does not depend solely on very high reliability or data integrity (e.g., Facebook, Google and others). As a result, developers of these horizontal deployments will not typically be as familiar with Oracle's offerings. The addition of MySQL gives Oracle greater presence or "mindshare" with this entirely different community of web-centric developers and customers.

- *Oracle Berkeley DB and Database Lite vs. MySQL.* Berkeley DB and Database Lite are both products targeting embedded devices. As such, they are designed to consume very little computer resources when running. To achieve that goal, Berkeley DB and Database Lite have reduced functionality and capacity, even as compared to MySQL. In fact, BerkeleyDB is not an SQL database. It allows applications to

scaling usually refers to running multiple instances of an application or database on multiple independent computers in order to meet a customer's scale requirements. By "vertical" scalability the Parties mean the need to add large volumes of new users with large datasets and be able to handle large amounts of concurrent users accessing the same data while maintaining the integrity of the dataset. Vertical scaling typically refers to running a single instance of an application or database by adding more processors and storage to support required volume and complexity.

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programmatically store and retrieve unstructured “key/value pairs” but does not support relational operators. Oracle Lite is a SQL database, however that supports, at most, 64 concurrent accesses (16 in some editions), it cannot be accessed over a network, and includes only basic query implementation techniques making it impractical to use for anything small data sets, much smaller than even MySQL supports.

- **Oracle Weblogic and iAS vs. Sun GlassFish.** Oracle’s application server offering differs from Sun’s Glassfish product in four important ways:
 - First, Oracle’s application server has a number of features (including rolling upgrades, “on-line” patching and reconfiguration, dynamic systems tuning and resource pooling) that are integral to its architecture and are designed to provide very high levels of performance, scalability and reliability. Sun’s application server does not provide many of these features.
 - Second, Oracle’s application server provides services for transaction management, message queuing, connectivity to external resources and security (authentication and authorisation), which are significantly more advanced than Sun’s application server.
 - Third, Oracle’s application server provides several pieces of value-added functionality to improve performance and reliability, such as an in-memory application data grid (allowing applications to access large quantities of data directly in-memory).
 - Fourth, as a result of these and other differences, Oracle’s application server is typically deployed to run mission-critical business applications as the embedded application server that ISVs use within their applications and within the core transaction processing systems of a company. Sun’s application server, in contrast, is seen as a more lightweight solution that is suited for deployment for departmental applications.
- **Oracle ESB vs. Sun ESB.** From a technical standpoint, the offerings of the Parties in this area are not close substitutes. In particular, Oracle’s ESB differs from Sun’s in four important ways:
 - First, it is designed based on very different standards from the one that Sun’s ESB supports. Oracle’s ESB is based on

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standards such as XSL-T, XQuery, Java Messaging Service, Java Connector Architecture and Services Component Architecture, while Sun's is based on a specification called Java Business Integration JBI.

- Second, Oracle's ESB provides much richer functionality than Sun's in a variety of areas: out-of-the-box adapters to connect to a variety of different enterprise systems and applications; significantly better performance and scalability; support for multiple messaging transports; support for distributed messaging topics and destinations for high availability; and rich business rules engine and policy management. Sun's ESB does not provide such features and, as a result, is not suited to be deployed in many places where Oracle's ESB is suited for use, as described under point (c) below.
 - Third, Oracle's ESB is typically used to integrate mission-critical systems and business applications within an enterprise's information technology department, while Sun's ESB is used for tactical integration of small, low-end departmental systems.
 - Fourth, Oracle's ESB is a mature product with close to 6000 production customers while Sun's ESB, released less than 18 months ago, is a significantly less mature product with only a very small number of customers.
- ***Oracle WebCenter, Weblogic and Portal vs. Sun Glassfish WebSpace Server and Sun Portal Server Secure Remote Access.*** Oracle's Enterprise Portal differs from Sun's portal product in four important ways:
 - First, Oracle's Enterprise Portal is based on an industry standard development framework based on a standard called Java Server Faces and Enterprise Java Beans which is used to build the web site or portal along with a standard interface through which users can integrate content and applications into the portal called JSR-168/WSRP. Sun's Web Space Portal is based on a proprietary programming framework that is used to develop the web site or portal and it only supports JSR-168/WSRP to integrate content and applications.
 - Second, Oracle's Enterprise Portal provides significantly richer out-of-the-box functionality for content management and search, including facilities for rich text editors and a site studio that users can use to contribute content, document format conversion, content integration from various sources, digital

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asset management, federated search and content analytics. Sun's enterprise portal does not provide out-of-the-box functionality for sophisticated content contribution or management.

- Third, Oracle's offering also provides significantly richer out-of-the-box functionality for enterprise social computing including out-of-the-box facilities that allow users to collaborate through the portal, including wikis, blogs, RSS, discussion forums, presence, chat and messaging. Sun's enterprise portal does not provide such out-of-the-box functionality.
- Fourth, Oracle's enterprise portal provides pre-packaged integration with a number of enterprise systems and applications, including content management systems such as Documentum, Filenet, Sharepoint and Oracle; business applications such as SAP, Peoplesoft, Siebel and Oracle e-Business Suite; search technologies such as Google, Fast, Autonomy, Oracle Search and others; and a variety of other solutions. Sun's Enterprise Portal requires custom development of this functionality.
- **Oracle BPMS vs. Sun BPMS.** Oracle's BPMS offering provides rich capabilities for targeting the business user, which is significantly different from Sun's offerings in the following ways:
 - First, Oracle provides a comprehensive BPMS platform that can execute *integration-centric, human-centric, document-centric* processes in a single, unified runtime. This includes support for BPMN-based workflows, business user rules, business user notifications and document services. Sun's JCAPs offering is focused on integration-centric use cases using the lower level BPEL process language only. This implies that users cannot model all types of enterprise business processes within the same environment.
 - Second, Oracle's BPMS offering is focused on business user empowerment during various phases of the process lifecycle – modelling, execution and operation. This includes BPA Suite, with support for 100+ high-level business model types which can then be stored in a common repository. Sophisticated process simulation, activity-based costing and risk analysis are supported. Additionally, there is a lightweight BPMS Studio for business users to collaborate with their IT counterparts in a single environment, with business users creating the model and

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IT implementing the services and forms for user interaction. Sun's does not include any tools for business users.

- Third, Oracle's BPMS offering also includes sophisticated capabilities to handle human interactions via an out-of-the-box work list with features such as delegation, task dispatching, escalation, business rules, *etc.* Additionally, there is tight integration with desktop tools (Word, Excel, Outlook) and portals. JCAPS does not have comparable capabilities

For the reasons further discussed in Section 7, the combination of Oracle's and Sun's assets in these areas will not lead to competitive concerns.

D. VERTICALLY AFFECTED MARKET

116. In addition, one could theoretically argue that, because Oracle's enterprise applications are based on the Java development environment, development environments potentially could be viewed as a vertically affected relevant market as defined by the Form CO. However, as discussed in more detail in Section 7, such a notion is erroneous: Oracle's acquisition of Sun's Java assets will in fact lead to greater competition, due to Oracle's incentives to promote an open, unified Java development environment.

E. DISCUSSION OF COMMISSION PRECEDENTS IN RELATION TO MARKET DEFINITION

117. *Database.* As far as the parties are aware, the Commission has not explicitly addressed the appropriate definition of database markets in detail in any of its previous decisions. In *Oracle/Siebel*⁵⁰ the Commission mentioned database, but did not analyse it in detail or provide a market definition, because the case concerned Customer Relationship Management (CRM) applications and Siebel was not active in databases.⁵¹
118. Similarly, in *IBM/Informix*⁵², the Commission considered markets for "legacy" database products and distributed database products, but left open the question of whether legacy and distributed database products constituted separate markets.⁵³

⁵⁰ Case COMP/M.3978 *Oracle/Siebel*. For the sake of completeness, the Parties also point to Case COMP/M.3216 *Oracle/PeopleSoft*, which also primarily concerned Enterprise Application Software.

⁵¹ Case COMP/M.3978 *Oracle/Siebel* paragraphs 37-39.

⁵² Case COMP/M.2460 *IBM/Informix*.

⁵³ *IBM/Informix*, paragraphs 7-12.

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119. The Parties believe that the appropriate market definition for database includes all database products, which is consistent with the practices of analysts and database distributors. A database product market definition based on operating systems, for example, would be at odds with the manner in which customers choose software, at odds with the way database software is developed and at odds with considerable Commission precedent in both merger and Article 82 cases. It seems readily apparent that Microsoft Windows competes against Linux and Unix and Microsoft .NET competes against Java. It is also clear that Microsoft Office competes against Sun's Open Office; Microsoft Internet Explorer competes against Firefox; Microsoft Exchange competes against Lotus Notes; and Microsoft Sharepoint competes against IBM Websphere, even though, in each case, the Microsoft product only runs on Windows. Database customers often choose the database first and then the operating system environment; only the smallest of customers choose database based on what operating system they run. Moreover most customers who employ servers running Linux/Solaris will also have servers running Windows, so the relevance of defining database markets by operating system is limited. As set forth below, the Parties assert that the geographic market for database is worldwide.
120. **Middleware.** The main Commission precedent of which the Parties are aware in relation to middleware is *Oracle/BEA*.⁵⁴ In its decision the Commission left the precise product market definition open but proceeded to analyse the transaction both under a "middleware" market definition and under a narrower market definition that identified the following middleware segments as distinct markets: application servers, portals, ESB and application integration middleware.⁵⁵ Regardless of the precise product market definition, the Commission indicated that the appropriate geographic market definition was worldwide.⁵⁶
121. The parties have followed the Oracle/BEA decision in the Form CO and have offered data both on the basis of all middleware and on the basis of distinct middleware sub-segments, namely application servers, portals, ESB, and process automation (BPMS), which makes up a large part of what IDC

⁵⁴ Case COMP/M.5080 *Oracle/BEA*. Middleware was also mentioned in Case COMP/M.4350 *HP/Mercury* but was not analysed further as there was negligible overlap between the parties in that market. The case primarily concerned Performance Management Software, which is not a relevant market in the Oracle/Sun transaction.

⁵⁵ *Oracle/BEA* paragraphs 7-13.

⁵⁶ *Oracle/BEA* paragraph 15.

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referred to as application integration middleware at the time of the BEA transaction.⁵⁷

122. In *IBM/IOLOG*⁵⁸, the Commission identified, *inter alia*, a market for process automation middleware, without further segmenting this market.⁵⁹
123. The Parties have followed the same approach in the Form CO as was adopted by the Commission in Oracle/BEA and believe that the definition of the middleware market should include all middleware and, as mentioned below, the geographic market for all middleware is worldwide.
124. ***Development Environments.*** The Parties believe that the acquisition of Java by Oracle must be examined at the platform (or, to use the IDC term, the development environment) level, rather than attempting to artificially break Java into several subcomponents. Attempting to define separate markets for each of the component elements of the Java platform would be an impossible task for many of the reasons identified by the Commission in prior software decisions.
125. For example, in *IBM/Rational*⁶⁰ and *IBM/Telelogic*⁶¹ the Commission considered the markets for software development tools. In relation to product market definition, the *IBM/ Telelogic* decision states that "*Although the identification of Requirements Management and Modelling tools as distinct product markets in the decision to initiate proceedings appears to be confirmed by the in-depth investigation, the exact boundaries of the relevant product markets (that is to say the products which are regarded as interchangeable by the consumers) are difficult to delineate. This is primarily due to the wide diversity of the Requirements Management and Modelling tools available in the market place, which in turn is a consequence of the heterogeneity of the customers' needs in relation to these tools.*"
126. In view of the foregoing, the product market definition in the present case can only provide a broad framework for the competitive assessment of the proposed transaction. Indeed, different software products falling within one product category, although providing similar core functionality from an abstract standpoint, may not be real substitutes from a customer's standpoint.

⁵⁷ In Case COMP/M.5317 *IBM/IOLOG*, paragraph 9, the Commission also relied on IDC's categorisation of packaged software.

⁵⁸ Case COMP/M.5317 *IBM/IOLOG*.

⁵⁹ *IBM/IOLOG*, paragraph 20.

⁶⁰ Case COMP/M.3062 *IBM/Rational*.

⁶¹ Case COMP/M.4747 *IBM/Telelogic*.

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In addition, different elements that may not point to the existence of distinct product markets must be taken into account in the framework of the competitive assessment. This concerns, in particular, elements such as product heterogeneity and differences in customers' needs.⁶² The geographic market definition was found to be at least EEA-wide and possibly worldwide but was ultimately left open.

127. In *Nokia/Trolltech*⁶³, the Commission also refrained from defining different markets for components of a development environment. Trolltech was active in "development and supply of software development infrastructure, tools, and platforms" for mobile devices.⁶⁴ With respect to these lines of products, named Qt and Qtopia, the Commission noted that "Whereas industry reports, including IDC, Gartner and EDC, traditionally distinguish different segments within the overall market for software development tools, Qt and Qtopia (which Trolltech variously describes as graphical user interface toolkits, software/application development frameworks, and/or application platforms) have features that cut across several industry categories and do not perfectly fit into any one category for which industry data is publicly available."⁶⁵ Consequently, it concluded that there were no separate markets for the components of the Qtopia development environment: "it is not necessary for the purpose of this decision to delineate the exact scope of the relevant product or geographical markets as the transaction does not raise competition concerns under any alternative market definition."⁶⁶
128. In its *IBM/Cognos* decision⁶⁷, which primarily related to business analytics (a market that is not an affected market in the *Oracle/Sun* case⁶⁸), the Commission briefly referred to Unified, or Integrated, Development Environments but ultimately left the market definition open. It found that *"Such tools are so-called integrated development environments used to develop software applications. However, Gartner, another industry analyst categorises exclusively such tools in its category of business intelligence platform software and has no own category like IDC. Further analysis of the*

⁶² *IBM/Telelogic*, paragraphs 122-123.

⁶³ Case COMP/M.5094 *Nokia/Trolltech*.

⁶⁴ *Nokia/Trolltech* paragraph 3.

⁶⁵ *Nokia/Trolltech* paragraph 13.

⁶⁶ *Nokia/Trolltech* paragraph 16.

⁶⁷ Case COMP/M.3062 *IBM/Cognos*, paragraphs 13-14.

⁶⁸ For the sake of completeness the parties also point to Case COMP/M.4944 *SAP/Business Objects* (paragraphs 13-18) that also relates to business analytics.

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notification allows the conclusion that the precise product market definition can be left open for the purpose of the present case, since in all alternative market definitions considered the proposed operation does not raise serious competition concerns." This discussion was limited to a narrow category of development tools and did not extend or refer to development platforms/environments such as Java and .NET.

129. In the *Oracle/BEA* decision, which as discussed above concerned middleware, the Commission referred to development platforms/environments identifying Java and .NET as such in the context of its competitive analysis of the middleware market, although no detailed market definition was discussed, as development platforms/environments were not a relevant market. The Commission did acknowledge, however, that there was competition at the platform level: *"The merging parties offer Java-language (mostly according to the J2EE standard) middleware products, just like their major competitors IBM and Sun Microsystems. Microsoft also offers middleware but based on the competing .NET platform, including Microsoft's web server and application server products. The market investigation has clearly indicated that these products compete against each other."*⁶⁹
130. Defining the relevant market for Java on anything other than a platform or development environment level would be inappropriate for the reasons identified in the Commission's past decisions as demonstrated above. In addition, segmenting the components of Java would also not allow a comprehensive and well-rounded analysis of Oracle's incentives and plans regarding the Java platform in its entirety. The Parties also believe that the market for the Java platform is necessarily worldwide.

IV. Other markets in which the notified operation may have a significant impact

- 6.3 *On the basis of the above definitions, describe the product and geographic scope of markets other than affected markets identified in Section 6.1 in which the notified operation may have a significant impact, for example, where:*
 - (a) *any of the parties to the concentration has a market share larger than 25% and any other party to the concentration is a potential competitor into that market. A party may be considered a potential competitor, in particular, where it has plans to enter a market, or has developed or pursued such plans in the past two years;*

⁶⁹ *Oracle/BEA*, paragraph 11.

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- (b) *any of the parties to the concentration has a market share larger than 25% and any other party to the concentration holds important intellectual property rights for that market;*
- (c) *any of the parties to the concentration is present in a product market, which is a neighbouring market closely related to a product market in which any other party to the concentration is engaged, and the individual or combined market shares of the parties in any one of these markets is 25% or more. Product markets are closely related neighbouring markets when the products are complementary to each other or when they belong to a range of products that is generally purchased by the same set of customers for the same end use;*

where such markets include the whole or a part of the EEA.

In order to enable the Commission to consider, from the outset, the competitive impact of the proposed concentration in the markets identified under this Section 6.3, notifying parties are invited to submit the information under Sections 7 and 8 of this Form in relation to those markets.

A. "OTHER THAN AFFECTED MARKETS"

- 131. "Other than affected markets" as defined in the Form CO include markets in which one of the parties might be a potential competitor to the other party, hold important intellectual property rights, or is present on a neighbouring market of complementary products purchased by the same set of customers for the same use. In the context of the Transaction, the third category is the only relevant one. Sun and Oracle are not potential competitors in markets where they are already present, and neither holds particularly significant intellectual property rights related to the affected markets (relative to their competitors).
- 132. Sun and Oracle are active in qualifying neighbouring markets, however. Oracle's reported share in database exceeds 25%. Products complementary to databases provided by Sun can be said to include middleware, operating systems and databases: these are generally products that are used together in a system. Nevertheless, as discussed in more detail in Section 7, the combination of Oracle's and Sun's assets in these areas will not create incentives or the ability for Oracle to use its position in databases to foreclose competition in these related markets.

B. GEOGRAPHIC SCOPE OF THE "AFFECTED MARKETS" AND "OTHER THAN AFFECTED MARKETS"

- 133. The geographic market for all of the types of software and hardware identified above is worldwide, as customers consider offers from vendors

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from all parts of the world; there are no specific barriers or other technical hurdles that restrict vendors from responding to invitations for proposals, regardless of the customer's geographical location; and vendors sell the same products in all countries, as customer demand does not vary across regions as there is generally no need for local product adaptation to reflect different language, legal or accounting requirements. For these reasons, conditions of competition are essentially homogeneous worldwide and there is no basis for distinguishing narrower geographic markets.⁷⁰

134. While certain business activities, notably the sales process, by their nature involve more localised operations, this does not alter the fact that competitive dynamics are not determined by the customer's location (to the extent that the concept of customer "location" even makes sense in the context of middleware software deployments). For management and logistical reasons, sales teams are organised on broad geographic lines, although the responsibilities of any given sales team are often multi-national. The need to have a certain regional presence for sales purposes does not act as a barrier to entry and does not restrict the ability of any vendor with a credible product to compete effectively worldwide. Even suppliers operating in markets that are clearly global in scope will invariably tend to organise some aspects of their business on narrower geographic lines, without this having any bearing on the homogeneity or otherwise of competitive conditions across different geographies.
135. As regards after-sales support services, these are not organised on a regional basis. Instead, they are provided remotely from locations that meet the criteria of cost-effectiveness and ability to offer a seamless service to customers. The parties maintain a number of technical support centres in different time zones around the world in order to offer 24/7 support. In exceptional cases where issues cannot be resolved through the usual support infrastructure, the parties' sales representatives may visit the client site to help with the identification and resolution of issues. This scenario involves the sales organisation, however, rather than a dedicated local or regional support team.

⁷⁰

There are several EC precedents suggesting that software markets are worldwide or at least EEA-wide: Case COMP/M.5080 *Oracle/BEA*, Case COMP/M.3978 *Oracle/Siebel*, Case COMP/M.4944 *SAP/Business Objects*, Case COMP/M.4987 *IBM/Cognos*.

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SECTION 7

Information on affected markets

For each affected relevant product market, for each of the last three financial years:

- (a) for the EEA territory;*
- (b) for the Community as a whole;*
- (c) for the territory of the EFTA States as a whole;*
- (d) individually for each Member State and EFTA State where the parties to the concentration do business; and*
- (e) where in the opinion of the notifying parties, the relevant geographic market is different;*

provide the following:

- 7.1 an estimate of the total size of the market in terms of sales value (in euros) and volume (units). Indicate the basis and sources for the calculations and provide documents where available to confirm these calculations;*
- 7.2 the sales in value and volume, as well as an estimate of the market shares, of each of the parties to the concentration;*
- 7.3 an estimate of the market share in value (and where appropriate, volume) of all competitors (including importers) having at least 5% of the geographic market under consideration. On this basis, provide an estimate of the HHI index pre- and post-merger, and the difference between the two (the delta). Indicate the proportion of market shares used as a basis to calculate the HHI. Identify the sources used to calculate these market shares and provide documents where available to confirm the calculation;*

INTRODUCTION: SOURCES FOR SHARE ESTIMATES

136. **Generally.** For the purposes of this Section 7, shares as reported by market analyst IDC are relied on, measured, where possible, on revenues and shipments. 2007 shares have been provided throughout. The Parties are not aware of 2008 market shares that are currently available in IDC reports. **Annex 2** provides an overview of these shares and a description of the manner in which IDC accounts for these shares. As noted therein, analyst market share methodologies in general are flawed for purposes of a competitive analysis because the categorisation of software into segments is not based on a rigorous substitutability analysis and reported revenues are based on estimates and self-reported and largely unverifiable revenue figures

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of the vendors. Moreover, the analysts' figures systematically tend to underreport Microsoft market share measured by revenues and shipments in a number of markets where Microsoft's offering is bundled with the Windows operating system (*e.g.*, application servers, and also databases, to the extent that some versions of Windows Server bundle SQL Server). In addition, the metrics employed by the analysts can confuse or misreport the competitive positions of participants. For example, the analysts include revenues derived from a mix of new licenses and maintenance revenue, rather than providing an isolated view of new license sales. As a result of the above, and of the more fundamental challenges to market definition in middleware discussed throughout this Form, neither IDC's product categories nor reported revenues necessarily correspond with the realities of the marketplace or with vendors' or customers' different perceptions of the middleware space.

137. The issues with analyst shares are particularly acute for middleware because middleware vendors do not publicly report their revenues on a product basis. Middleware product suites are in any case highly different in breadth of products and depth of functionality, rendering strict revenue comparisons between vendors virtually impossible, even if vendors reported the relevant revenues publicly. Finally, the way in which vendors price and sell their middleware offerings can be very different, and since middleware products are often sold along with other products in the context of a solution-oriented purchase, it is virtually impossible to allocate revenues to specific products with any accuracy.
138. As mentioned above, the Parties have mostly relied on share estimates by analyst IDC based on revenue. Another method to calculate market share would be to attempt to measure downloads or unit deployments or implementations of a given product. This approach may not be better than using revenues as a proxy for market share for three reasons: (1) measuring downloads of a product (particularly an open source product which is freely available for download) will not provide an accurate depiction of actual deployment by customers or other indicia of actual market share (*i.e.*, users may download multiple times, but never use the product); (2) defining what constitutes deployment or implementation by customers with no reference to revenues is difficult, necessarily subjective and may not capture actual indicia of market share (*i.e.*, if a customer uses a product only for testing or reference purposes, but not "live" deployment, counting that use may skew market share); and (3) even if one were to settle on a definition of how a download constitutes a deployment and, therefore, market share, it would be difficult to obtain accurate and useful information on deployments or implementations as that information is held by the customers, not the vendors, of the products in question.

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139. Having said that, the Parties are aware that analysts have used shipments as a proxy for adoption in the marketplace in the past.⁷¹ For example, IDC estimates that in 2005, Microsoft SQL Server increased its market share measured by unit shipments to 41.1%, up from 37.7% in the previous year.⁷² Oracle followed in second place, with 29.0% of units shipped, consistent with the previous year's 28.7%. In fact, by these measurements, Microsoft shipped more databases than Oracle and IBM combined. This data is presented in paragraph 142 below.

A. HORIZONTALLY AFFECTED RELEVANT MARKETS

A.1 Discussion of unilateral effects

A.1.1 Database

140. **Market size.** The database market was estimated to have grown by 12.6% from USD 16.7 billion in 2006 (approximately EUR 12.2 billion) to USD 18.85 billion (approximately EUR 13.75 billion) according to IDC.⁷³ IDC attributes 46.9% of RDMBS revenues to the EEA countries, amounting to USD 8.8 billion (approximately EUR 6.4 billion).

141. **Vendor shares.** The table below shows the shares (by revenue) of database vendors, including Oracle, IBM, Microsoft, Sun (MySQL) and others on a worldwide basis for database for 2006 and 2007, as estimated by IDC:

⁷¹ See IDC, *Server Workloads Forecasts and Analysis Study, 2005-2010*, July 2007 quoted in paragraph 88 of the Draft Form CO. This study measures server workloads running on specific databases, which Oracle used as a proxy for database share by unit shipments.

⁷² *Id.*

⁷³ IDC, *Worldwide RDBMS 2007 Vendor Analysis: Top 10 Vendor Licence Revenue by Operating Environment and 2008 Year in Review*, December 2008.

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*Table 2: Database worldwide shares by vendor (by revenue)
2006-2007*

Database Vendor	IDC share % (by revenue)	
	2006	2007
Oracle	44	44.2
IBM	21.2	21
Microsoft	18.6	18.5
Sybase	3.6	3.5
Teradata	2.7	3.3
Sun (MySQL)	-	2 ⁷⁴
Others	9.9	9.3
Total	100	100

Source: IDC, *Worldwide database 2006 Vendor Analysis: Top 10 Vendor License Revenue by Operating Environment and 2007 Year in Review*, December 2007; IDC, *Worldwide database 2007 Vendor Analysis: Top 10 Vendor License Revenue by Operating Environment and 2008 Year in Review*, December 2008.

142. The table below shows the shares (by shipments) of database vendors, including Oracle, IBM, Microsoft and others on a worldwide basis for 2005, as estimated by IDC:

*Table 3: Worldwide database shares (by shipments) by vendor
2005*

Database Vendors	IDC share % (by shipments)
Microsoft	41.15
Oracle	29.06
IBM (including Informix)	9.58
Sybase	2.87
Others	17.35
Total	100

Source: The table was calculated manually based on IDC, *Server Workloads Forecasts and Analysis Study, 2009-2010*, July 2007.

143. IDC and other analysts probably undercount Microsoft's revenues from SQL Server since its database is often embedded in other Microsoft products

⁷⁴ Sun MySQL does not appear in this IDC market share table, requiring the Parties to assume that Sun's market share is included under "others" and, therefore, is below the last vendor mentioned in the table. The "others" in this table have a market share of 4.2%, the last vendor mentioned is Siemens with a market share of 0.4%. Sun's share, therefore, is assumed to be less than 0.4% (see Answer 2). This assumption is consistent with IDC's report, *Worldwide Relational Database Management Systems 2007 Vendor Shares, June 2008*, which listed MySQL as the 14th largest database vendor with 0.2% market share.

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(Windows, SharePoint, *etc.*) and the revenue is not separately reported for database. In fact, Microsoft's SQL Server database is sold in a number of ways: as a standalone product; as part of a bundle with other Microsoft products; and as a "technical requirement" of certain Microsoft products. SQL Server is sold standalone in the same way Oracle or IBM sell the database standalone. SQL Server may be sold directly to an end user as a standalone product, or may be included as the database component of a project bid from a systems integrator or a value added reseller. For example, Microsoft SQL Server 2008 for SAP, which "provides a scalable, high-performance database engine for SAP applications that require the highest levels of availability and security, while reducing the total cost of ownership through enhanced enterprise-class manageability. With this compelling TCO value proposition, Microsoft Windows and SQL Server is well positioned as an enterprise ready platform for companies of all sizes running SAP solutions."⁷⁵ Microsoft SQL Server is also sold in bundles with, for example, Microsoft Small Business Server, Windows Essential Business Server, Microsoft BackOffice Server, and Microsoft Dynamics (Microsoft's enterprise applications). There are also substantial technical ties where Microsoft SQL Server is closely aligned with many of Microsoft's products and serves as a de facto 'technical requirement' of the other Microsoft products, although with the SQL Server APIs built into .NET it is sometimes difficult to determine exactly where the technical ties lie. Microsoft Exchange, Sharepoint, Dynamics CRM, Visual Studio, Virtual Earth and Business Intelligence all have SQL Server technical dependencies. Microsoft's strength in database is better demonstrated by IDC's measurement of market share by shipments, on the basis of which Microsoft's SQL Server has more shipments than Oracle and IBM combined.⁷⁶

144. The Parties are not able to estimate the total number of MySQL installations, as they are unaware of any source that tracks database 'installations'. Oracle doesn't license its database products this way and is unaware of competitors that license by installations. The same applies not only to MySQL but also other open source or proprietary databases.
145. While Sun does know the number of *downloads* of MySQL, there is no ability by Sun or any third party to track whether the user 'installs' MySQL once downloaded, let alone the number of 'installations' in commercial use at any time. See below for Sun's estimate of MySQL downloads, of which Sun estimates that approximately 25% of total MySQL downloads are in the EEA.

⁷⁵ See <http://www.microsoft.com/sqlserver/2008/en/us/sap.aspx>

⁷⁶ A fact touted by Microsoft itself: <http://www.microsoft.com/sqlserver/2008/en/us/news-reviews.aspx>.

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146. Sun estimates that there are 12 million total active installations of MySQL worldwide and that, based on the location of downloading users, approximately 3 million of those active installations are in the EEA. However, each active MySQL user will typically make a number of MySQL downloads in any given year (for example, downloading MySQL upgrades, connectors, tools, etc). To that extent, the number of MySQL downloads will typically be greater in any given year than the total number of active MySQL installations. Set out below, therefore, is the number of (a) total MySQL-related downloads (including MySQL peripheral products such as connectors, tools etc); and (b) MySQL only downloads.

(A) Total MySQL-related downloads (including peripheral products such as connectors, and tools) were:

- CY 2007: 23,061,000
- CY 2008: 23,335,000
- CY 2009 (through June 30, 2009): 11,824,000

(B) MySQL-only downloads:

- CY 2007: 14,212,000
- CY 2008: 14,121,000
- CY 2009 (through to June 30, 2009): 7,114,000

147. **Competitive effects.** Significant non-coordinated effects are only possible if the merging parties are particularly close competitors for a substantial group of customers. These conditions are not present in the database market, either as a general matter or particularly, given the open-source nature of Sun's MySQL product. In addition, all customers are likely to continue to have credible alternative database suppliers available in addition to the Parties. Thus, the Transaction will not give rise to any appreciable adverse non-coordinated effects on competition in the database market:

- ***Sun's database share only marginally adds to Oracle's.*** As a result of the Transaction, given Sun/MySQL's insignificant share, the combined entity's revenue market share would remain constant at approximately 44.2% based on IDC's revenue numbers. IBM and Microsoft are strong competitors with a revenue market share of respectively 21% and 18%.⁷⁷

⁷⁷ IDC, *Worldwide RDBMS 2007 Vendor Analysis: Top 10 Vendor Licence Revenue by Operating Environment and 2008 Year in Review*, December 2008.

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- *HHI delta is below the Horizontal Guidelines' safe harbour.* Based on IDC data, the post-Transaction HHI is approximately 2809, with an HHI delta of 27. According to IDC, the delta is well below 150, i.e., the safe harbour applied by the Commission to markets with an HHI over 2000.
- *Oracle's and Sun's respective database products serve different needs.* As discussed in Section 6 above, paragraph 115, Sun and Oracle's database products are not particularly close substitutes. The main technical criteria according to which databases may be compared are (a) scalability (how much data can the database handle without encountering meaningful reductions in performance?); (b) availability (what happens if one part of the database fails?); and (c) concurrency (how many users can access the same data in the same application at the same time while maintaining data integrity?). Security, configurability, access management, auditing, and administration (ease of use) are also important characteristics. In each one of these areas you would find: 1) that Oracle and MySQL are on the opposite ends of the technical spectrum; and that 2) Microsoft SQL server and others are far better MySQL substitutes.

Thus, MySQL is useful for horizontal scalability, with speed of development and ease of deployment being paramount, whereas Oracle is designed for vertical scalability with security, reliability and scalability paramount. Oracle's database is deployed where transaction integrity, high volumes, compliance and archiving issues are relevant and large shared memory space is required. In general, Oracle and MySQL compete only at the edges of their functionality. Due to these technical differences, the products see very little head-to-head competition – they are simply different tools for solving entirely different problems.⁷⁸

In other words, customers seldom choose between Oracle 11g and MySQL – the nature of the customer's database requirements (from a functional perspective) will usually make one of either Oracle or MySQL unsuited for any particular deployment. However, it is important to state that not all of the criteria listed above are important for all customers or all database applications / deployments. In general, it is fair to say that

⁷⁸ The fact that Oracle database and MySQL address different customer needs and hence do not compete head-to-head is succinctly stated in a report from analyst The 451 Group: "MySQL is largely complementary to Oracle's Database products, rather than directly competitive. MySQL was created as a lightweight database for Web and departmental applications that do not require the functionality offered by the likes of Oracle and IBM's DB2, and the company grew rapidly by avoiding direct competition with those vendors". The 451 Group, "The wider implications of Oracle's impending ownership of MySQL", May 2009. The 451 Group is an independent technology-industry analyst company that was founded in 2000, and has offices in the US and Europe. More details can be found at <http://www.451group.com/about/overview.php>. The full report is submitted as Annex 21.

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you would find Oracle and MySQL on the opposite ends of the spectrum regardless of the analysis. For example, Oracle is far more scalable than MySQL. Conversely, MySQL is far easier to administer than Oracle. Oracle has far more features focused on security, governance, auditing, and analytics, while MySQL does not. To the extent there is a small area of technical overlap between Oracle and MySQL it would tend to be customer specific. For example, a customer might be willing to accept slower performance and stretch MySQL to its upper limits of scalability in exchange for ease of use – but you would only see this on the margin. That said, Oracle and MySQL have different design points and while they are both databases, they are fundamentally different tools designed for different jobs. More importantly, there are at least five alternative databases that fall between MySQL and Oracle on the “chain of substitutability,” they are: Postgres, EnterpriseDB, Sybase, IBM and, most importantly, Microsoft SQL Server. For users that find themselves “between” MySQL and Oracle, the best technical answer is Microsoft as Microsoft much more closely targets design points similar to MySQL.

Figure 2: Sun internal document showing absence of closeness of competition between Oracle Database and Sun MySQL



The addition of the open-source MySQL database gives Oracle a database product that serves a fundamentally different technical purpose than any of Oracle's current database offerings. Oracle expects to continue the current development plans for MySQL to appeal to web-centric developers and customers and to create a stronger competitive alternative to Microsoft's SQL Server.

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Oracle's incentives in encouraging adoption of MySQL by these groups are simple: Oracle's current products do not best meet the needs of these customers, which means that Oracle is losing opportunities to establish relationships with potential customers – opportunities that will often go to Microsoft. By strengthening MySQL, Oracle gains access to these developers and customers to sell support services and cross-sell and upsell Oracle's other products.

- ***Sun and Oracle are not particularly close competitors.*** The conclusion that Oracle and Sun are not close competitors in databases is strongly supported by the sales opportunity data that Oracle has available.⁷⁹ A review of 99,856 Oracle database sales occurring between 1 May 2007 and 1 May 2009 identified Sun as a primary competitor in 0.67% of the transactions, and a primary or secondary competitor in 0.92% of the transactions. Both Microsoft and IBM appeared much more frequently than Sun, with Microsoft a primary competitor in 22.73% of the transactions, and IBM a primary competitor in 12.48% of the transactions.

In European deals, out of 31,992 database transactions in the EU, Sun was mentioned as a primary competitor in 316 transactions (0.99%) and as a primary or secondary competitor in 450 transactions (1.41%). Concentrating on key deals only, the numbers are even lower- Sun was specified as a primary competitor or as any competitor in 0.47% and 1.18% of the key deals in this category, respectively.⁸⁰ In the instances where Oracle and Sun competed head to head, Oracle won roughly two thirds of the time. As with the global deal statistics, two competitors appeared much more often than Sun as Oracle competitors. Microsoft was mentioned as a primary competitor in 6,280 transactions (19.63%), roughly 20 times more often than Sun, and in 22.52% of the key deals. IBM was a primary competitor in 2,373 transactions (7.42%) and in

⁷⁹ There are two types of data available to Oracle. First, Oracle maintains a CRM (Customer Relationship Management) database which tracks Oracle opportunities and which contains fields for competitors in any given opportunity. This is the type of data to which the numbers mentioned in the text relate. Second, Oracle maintains an "HQ App" system, which is essentially an e-mail approval system for sales people to request discounts for particular products. The HQ App system includes a "justification" section where sales people may choose to include competitive dynamics (such as potential competing offerings) to justify a particular discount request. Of course, both of these systems are subject to limitations. The most significant limitation relates to the HQ app system, which tends to substantially overstate the competitive pressures in a given bid. Sales people are motivated to close business and as a result typically overstate the competitive pressure of a given bid in order to gain approval for a lower price. The CRM system is limited to the quality of the data input by the sales executive, who is under no obligation or specific incentive to be accurate or complete in their data.

⁸⁰ "Key deals" are deals identified as such by the Oracle sales representatives by selecting the corresponding option in the CRM system. There are a number of reasons why a sales representative may identify a deal as key, such as the revenue at stake or the strategic importance of the customer. Key deals represent around 10% of all sales opportunities.

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17.25% of the key deals, and was typically involved in much bigger transactions compared to Sun: the median revenue in transactions in which IBM was a primary competitor was four times higher than the median revenue in transactions in which Sun was a primary competitor to Oracle.

At times the relevant sales person filling in the CRM data fills in "Unspecified", "Unknown", or "Unidentified" in the "Primary Competitor" field. This may be because (a) there was no competitor (*e.g.*, follow on sales) (b) there was a competitor, but the sales person for whatever reason did not to fill in the field (c) the sales person was not aware if there was a primary competitor or the identity of competitors. Oracle is unable to reconstruct the competitive situation faced in a given transaction after the fact. Thus, it may be the case that "Unspecified", "Unknown", or "Unidentified" in fact represents an occurrence of Sun as primary competitor, but it could also be IBM, Microsoft or any other competitor. However, there is no reason to believe that in such cases, the relevant salespeople would have used "Unspecified", "Unknown", or "Unidentified" for Sun more frequently than Microsoft or IBM, for example. Thus, the CRM data would appear to represent a relevant proxy to measure closeness of competition despite its shortcomings.

Another way to consider the CRM data is to ignore the occurrences of "Unspecified", "Unknown", or "Unidentified". That approach leads to the following data:

Table 4: CRM data analysis results (databases)

DATABASE Primary Competitor	ALL Transactions		Dropped: Unspecified / Unknown / Unidentified		Dropped: Unspecified / Unknown / Unidentified / None	
	# of Transactions	% of Transactions	# of Transactions	% of Transactions	# of Transactions	% of Transactions
Any	31,992	100%	23,599	100%	11,994	100%
Sun	316	0.99%	316	1.34%	316	2.63%
Microsoft	6,280	19.63%	6,280	26.61%	6,280	52.36%
IBM	2,373	7.42%	2,373	10.06%	2,373	19.78%

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The column headed "ALL Transactions" presents the data discussed above, while the other two columns present the data if the occurrences of "Unspecified", "Unknown", "Unidentified" and "None" are dropped.

- *The open-source nature of MySQL eliminates potential for any-competitive effects.* Even if the products did compete, Oracle gains no ability to reduce output, as the open-source MySQL code is already beyond the control of the Parties. Viewed narrowly, one might erroneously characterise Sun as a gatekeeper of MySQL – deciding which modifications to include from the community in the next release of MySQL – due to the lack of a formal community process. The lack of a formal process and Sun's role is irrelevant with respect to MySQL because, while Sun may appear to be a gatekeeper, there is no fence to keep anyone out of the MySQL code. Because MySQL's source code has been publicly released under the GNU General Public License (GPL) v. 2, anyone can redistribute unmodified MySQL code – or modify it to build a competing database – by donating the modifications to the community. This is already happening: Google Inc. is a high-profile user of MySQL, for which Google pays no license fees. Google has terminated any paid support from Sun or MySQL, relying instead on internal developers. Google has also issued patches and other MySQL tools to the community when it did not agree with Sun's management of MySQL.⁸¹ In addition, a founder of MySQL has recently announced the Open Database Alliance, a vendor-neutral consortium designed to "become the industry hub for the MySQL open source database" and is "prepared to serve as the primary upstream source of MySQL derivative source code in the form of MariaDB, [i]f Oracle [...] maintains its version in a manner that is unpalatable to the broader MySQL community."⁸² Percona, Inc., has also already issued MySQL releases without requiring Sun's permission.⁸³ For a more detailed discussion of Google, MariaDB, the Open Database Alliance and the ability of open source to accelerate entry into a market, see Section 8 of this Form CO.

This is not an issue unique to MySQL, but to any open-source software distributed under the GNU General Public License v. 2, which generally allows anyone to copy, use and distribute *verbatim* copies of the source code, provided that a) all notices must be published; b) the vendor must include a disclaimer of warranty; and c) the vendor must provide a copy of the GPL license. The vendor may charge fees for transferring a copy

⁸¹ Google's MySQL offerings may be found at <http://code.google.com/p/google-mysql-tools/>.

⁸² See <http://www.prweb.com/releases/2009/05/prweb241784.htm>.

⁸³ See <http://www.percona.com>.

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or for providing separate warranty protection (*i.e.*, support). If, however, a vendor were to modify MySQL (or a portion of it) or create a derivative work and distribute the modifications or derivative work, the user must also agree that any work which, in whole or in part, contains or is derived from the GPL'd code must be licensed as a whole at no charge under the terms of the GPL license.

The Free Software Foundation, publisher of the GNU GPLv2 license, has stated that while a user cannot "incorporate" GPL-covered software into a proprietary product, *"in many cases [a user] can distribute the GPL-covered software alongside [a] proprietary system. To do this validly, one must make sure that the free and non-free programs communicate at arms length, that they are not combined in a way that would make them effectively a single program. The difference between this and 'incorporating' the GPL-covered software is partly a matter of substance and partly form. The substantive part is this: if the two programs are combined so that they become effectively two parts of one program, then you can't treat them as two separate programs. So the GPL has to cover the software offering in question in its entirety."*⁸⁴ A firm would still be able to provide "warranty protection," or service, for a fee, even under the GPL.

While there is no "control" over MySQL released under the GPL, Sun does retain the ability to release MySQL under a commercial license to those who do not want to comply with the terms of the GPLv2 license. As discussed above, the terms of the GPL licence require that (1) any derivative work of software licensed under GPL is also subject to the GPL, and (2) licensees that distribute a work licensed under the GPL must make the corresponding source code (including source code to derivative works) available to licensees. As a result, anyone that intends to modify or integrate MySQL software with other software and does not want to disclose the source code to those modifications or to the integrated product must purchase a commercial licence to avoid the source code distribution obligations of the GPL. Customers that purchase a commercial licence are almost entirely OEM distribution partners of Sun, but occasionally end users that customise the MySQL software for their own internal purposes may also take a commercial licence when

⁸⁴

See <http://www.gnu.org/licenses/gpl-faq.html#DoesTheGPLAllowMoney>.

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such end use also requires distribution of the software.⁸⁵ Please see **Annex 24**, which includes a list of commercial MySQL licensees.⁸⁶

Sun has never refused to sell commercial MySQL licences to any potential customer or partner and, in fact, has sold commercial licences to database software competitors such as Oracle and IBM. Sun's policy is to treat customers and distribution partners consistently and fairly in accordance with its internal sales policies and relevant competition laws. The only cases in which Sun has not successfully granted a commercial licence to a potential customer has been as a result of the parties not being able to negotiate mutually acceptable contract terms and never as a result of a decision by Sun to attempt to restrict a competitor's ability to compete with Sun. Subject to compliance with all relevant laws, Sun has the right to refuse to sell a commercial licence to the MySQL software as a result of its ownership of relevant MySQL intellectual property. However, as discussed above, it has not done so: Sun derives a significant portion of its MySQL revenue from OEM licence agreements allowing distribution of MySQL software under commercial licence terms, Sun has a greater financial incentive to sell commercial licences than to refuse to do so.

With an open-code base, generally available to the public, and competitors with the resources and reputation necessary to create legitimate competitive offerings, it is difficult to see how Oracle's acquisition of Sun/MySQL could have any negative competitive effect in the database market. Since the source code is available freely, it would seem that the state of competitors and competition immediately before the transaction and immediately after the transaction are identical. Analysts concur that it would be impossible for Oracle to "kill off" MySQL: "[B]ecause MySQL is an open source project, Oracle could not truly kill it off even if it wanted to. There are already a number of alternative development branches, or forks, of MySQL, and were Oracle to antagonise the MySQL user base, we would expect one of those to emerge to take MySQL's place (MariaDB, the version created by original MySQL creator Monty Widenius, would likely be a frontrunner). Oracle has little to gain by driving MySQL users into the arms of its rivals or

⁸⁵ For example, Suzuki as described above.

⁸⁶ This annex lists purchasers from the date of Sun's acquisition of MySQL. Sun is unable to provide a comprehensive list of customers predating its acquisition of MySQL. For FY2007, FY2008 and FY2009 Sun earned the following revenues from commercial MySQL licenses: Billings FY2007 (Subscription, OEM Licence, Cluster Licence): \$40,900; Billings FY2008 (Subscription, OEM Licence, Cluster Licence): \$58,646; Forecast FY2009 (Subscription, OEM Licence, Cluster Licence): \$72,282.

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'MySQL AB version 2.0,' and the company's executives should be well aware of this.'⁸⁷

It should be noted that any MySQL forks may or may not be compatible with previous versions of MySQL. As with any software product (whether or not open-source), this is entirely up to the particular vendor providing the alternative code. Most vendors who would provide support to MySQL would provide an exact copy of MySQL, rather than modified code. A vendor could, however, certainly modify the MySQL code to include changes that may not be compatible with prior versions. For example, modifications of the MySQL code to remedy an existing defect or "bug" in the software could result in certain features, functions or process in the new, patched version of MySQL being incompatible with previous versions.

So far, the work of MariaDB and Google appears to be compatible with the core MySQL database maintained by Sun. Future compatibility would be at the discretion of the alternative version's sponsor, depending, Oracle presumes, on customer demand for compatibility.

Due to the open source nature of MySQL, however, any changes creating backwards incompatibility are reversible since the source code for a prior version is freely available. Were Google to publish a MySQL fork, for example, that included changes that created incompatibilities which were unacceptable to other MySQL users, there is nothing that would prohibit MariaDB from distributing a version of MySQL with Google improvements (since they would be required to release the source code under the GPL), but without any incompatible change (to the extent that the incompatibility is not a necessary by-product of the improvement (e.g., a bug fix)).

With regards to the use of the MySQL trademark by forks of MySQL or companies offering technical support for MySQL, the MySQL trademark is owned by Sun and the MySQL GPL license does not grant a license to Sun's trademarks, which are a vital intellectual property right. However, Sun does not object to companies using the name MySQL in a manner that is fair use and does not constitute infringement under applicable law, including trademark law. Specifically, because MySQL is a trademark of Sun, a vendor could not call its product MySQL or a derivative of MySQL that would cause confusion or be misleading as to the origin or quality of the product (including its compatibility with Sun's MySQL),

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The 451 Group, *The wider implications of Oracle's impending ownership of MySQL*, May 2009, Attached as Annex 21.

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but the vendor could refer to its product as being compatible with Sun's MySQL, provided that such a statement is true and correct.

Even if one were to hypothesize that Oracle would allow MySQL to wither post-Transaction by not supporting it, that would not mean that MySQL would disappear or its success severely affected. The history of open source shows that most open source consumers and contributors do not want to risk using or working on an orphaned derivative, therefore they quickly gravitate toward what appears to be the most vibrant common ground. As evidence of that proposition, no examples of large open source projects suffering any substantial schism come to mind: Apache, Linux, Open Office, MySQL, GNU tools, and JBoss are all mature and have clear loci of management.

However, if Oracle's investment in MySQL were to flag or if Oracle no longer be provided the innovation and management valued by the open community, then Oracle would surrender the mantle of leadership and give other parties the opportunity to basically create the natural successor of MySQL. In other words, the community would move to the next version of Maria DB, etc., and leave Oracle/MySQL behind. Now it is true that if more than one party attempted to create a successor, there could be a temporary split. But almost certainly, one of those parties would have a broader appeal because of history or commitment, and the risk aversion of the user and contributor open source community would soon cause that party's offering to be anointed the true successor by acclaim—with MariaDB being the most likely candidate as it certainly has both history and expressed commitment on its side.) The risk, then, is not that MySQL splits and is affected as much as it is that Oracle's leadership would be singularly affected.

Even if it were possible to somehow "close" MySQL or no longer issue it under the GPL (which it is not), Oracle's past open-source acquisitions further indicate that Oracle will not use its position to restrict competition. For example, Oracle acquired Innobase OY, makers of InnoDB,⁸⁸ and Sleepycat Software, makers of Berkeley DB. With

⁸⁸ InnoDB is a storage engine produced by Innobase OY (a subsidiary of Oracle) for use exclusively with MySQL, as an alternative to MySQL's default storage engine ("MyISAM"). The MySQL database product is designed to allow users to choose the storage engine best suited to their use. MyISAM, the MySQL default, is aimed at general-purpose database use. InnoDB, by contrast, is a transactional storage engine. MySQL offers several "native" storage engines in addition to MyISAM and InnoDB; customers may choose the storage engine most suited to their use. As there is a low barrier to entry, particularly for very specialised storage engines, a number of third parties have also created storage engines for MySQL, including the following: NitroEDB – NitroSecurity (specialised for real-time use); BrightHouse (specialised for data warehouse use); IBMDB2I – beta version only (data is stored on IBM DB2); PrimeBase XT – PrimeBase Technologies; OpenOLAP; BDB – discontinued in MySQL 5.1, but still shipped on Linux distributions. In addition, customers may develop their own storage

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InnoDB and BerkeleyDB, Oracle now offers two different open source database products with different performance and operational characteristics. These products complement other Oracle database products, including TimesTen, Oracle Lite and the flagship Oracle database. Users select which product to use based on the specific technical requirements of their application.

In each instance, the products are still available as open-source and Oracle continues to invest and improve both products. In fact, with respect to InnoDB, if Oracle were going to use its position to impact competition, it could have asserted itself against the MySQL community. It did not; in fact, under Innobase's agreement with Sun, Innobase agreed to not fork MySQL or provide support for MySQL—in marked contrast to Google, MariaDB or the Open Database Alliance.⁸⁹ Again, as discussed above, Oracle's software strategy depends on adoption, not foreclosure.

It is instructive in this sense to describe the ways in which Oracle has continued to support and improve on InnoDB and Berkeley DB since it acquired them:

- ***InnoDB***: Since the acquisition of Innobase Oy in October 2005, Oracle has continued the development of InnoDB and expanded its investment in open source database. For example, Oracle has increased the size of the InnoDB development staff and released new versions and new products under the open source GPL license.

Oracle/Innobase has maintained an excellent working partnership with MySQL, both before and after its acquisition by Sun. In 2006, Oracle was named "Partner of the Year" by MySQL. That year, Oracle released several upgrades to InnoDB as distributed by MySQL, including both bug fixes and improvements in performance and scalability. Oracle has continuously created product enhancements and fixed bugs in InnoDB and released them to MySQL (and now Sun) under the GPL.

Oracle has also developed two new products derived from the

engines internally to suit their specific needs. InnoDB "competes" only as a storage engine for the MySQL database. Therefore, all alternatives to InnoDB depend – by definition – entirely on MySQL.

⁸⁹ Some firms which have entered into channel partner agreements with Sun have agreed to "no forking" provisions. However Sun is in the process of phasing these out, and in any event there remain numerous firms which have not entered into such agreements and are therefore free to create a fork. Indeed some have already done so (e.g., Percona and Maria DB).

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InnoDB technology. The first of these is the InnoDB Plugin, which includes significant new functionality and performance. Like the version of InnoDB distributed by MySQL, the InnoDB Plugin is available under the open source GPL license, and is available at no charge from the Innobase website. The InnoDB Plugin works similarly to the built-in InnoDB distributed by MySQL, in that it can be used only as a storage engine running under the MySQL database server. The benefit to users of this product is that it adds new features that MySQL/Sun could not accept in the middle of the MySQL 5.1 product life cycle. The InnoDB Plugin therefore delivers new features to users earlier than would have been possible otherwise.

Another new product is Embedded InnoDB. This product is also based on the InnoDB technology, and is targeted at developers building applications for small devices, independent software vendors (ISVs) and original equipment manufacturers who need to embed database technology in their software and hardware products. This includes a variety of "edge" applications, devices, robotics, etc. Embedded InnoDB delivers all the high-performance, reliability and rich functionality of InnoDB with a flexible, powerful, programmatic API. It has the operational characteristics required for applications requiring a small memory footprint, zero administration and high performance and reliability. Embedded InnoDB is also available from the InnoDB website under the open source GPL license, and it can be downloaded and deployed at no cost.

- ***BerkeleyDB/Sleepycat:*** Oracle remains similarly committed to the Berkeley DB family of products from Oracles acquisition of Sleepycat Software in 2006. Since closing that acquisition, Oracle has retained a majority of the original Sleepycat team and doubled the size of the total product development team, a clear sign of the overall satisfaction of the developers with the level of commitment that Oracle is showing to open source, generally, and the BerkeleyDB team and products, specifically.

As a result, in the last 3 years, the Berkeley DB team has released Berkeley DB 4.5, 4.6 and 4.7; Berkeley DB Java Edition 3.2 and 3.3; and Berkeley DB XML 2.3 and 2.4, all with significant improvements to the functionality and performance of the family of products. Oracle has also invested in a team of customer supported engineers who are dedicated to supporting Berkeley DB products and who are deployed around the world to guarantee 24x7 coverage. Oracle has also invested in

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developing a customer training course on each of the Berkeley DB products and on dedicating personnel to the creation and delivery of these courses. Each of these is an investment that Sleepycat could not have afforded on its own and that Oracle has undertaken despite the lack of revenues being generated by the open source products.

- ***Database market competitive dynamics remain intact after the Transaction.*** After the Transaction, the combined entity will continue to face strong competition from a number of powerful sources, including IBM and Microsoft. With Google and others able to exploit the MySQL code, the Transaction will not reduce competition from open source offerings. Accordingly, the Transaction will not give rise to any appreciable adverse non-coordinated effects on competition.

A.1.2. MIDDLEWARE: APPLICATION SERVERS, PORTALS, ESB AND BPMS

(i) The middleware business generally

148. ***Category size.*** According to IDC, the size of the worldwide middleware business, referred to by IDC as “Application Deployment Software,” amounted to USD 13.5 billion (approximately EUR 9.7 billion) in 2007 and grew by 17% in 2007.⁹⁰ North America, Europe, Middle East and Africa (“EMEA”) revenues accounted for roughly 35.4% of worldwide middleware revenues in 2007.
149. ***Vendor shares.*** The table below shows the shares (by revenue) of Oracle and Sun and other players on a worldwide basis for middleware for 2006 and 2007 as estimated by IDC:

⁹⁰ IDC, *Worldwide Application Deployment Software 2007 Vendor Shares: Growth Continues to Accelerate*, August 2008.

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Table 3. Applications Deployment Software worldwide shares by vendor 2006-2007



	2006	2007
Oracle	18.0%	18.0%
IBM	17.0%	17.0%
Microsoft	16.0%	16.0%
SAP	15.0%	15.0%
Oracle/Sun*	14.0%	14.0%
Other	20.0%	20.0%

Source: IDC, Worldwide Applications Deployment Software 2007 Vendor Share Forecast, published in Worldwide Applications 2007

150. **Competitive effects.** The Transaction will not significantly impede effective competition in middleware.

- *IDC would remain the clear middleware category leader over Oracle.* Sun's middleware share would only marginally add to Oracle's. IBM is the clear leader in middleware and would remain a post-Transaction with the highest combined share in 2007 of around 18% making IBM's share (i.e., approximately, the percentage point). Thus, IBM's middleware dominance would increase around 30% of Oracle/Sun's. The combined share will be well under 25%, the threshold set forth in the Guidelines for the protection of "no undue injury."
- *HHI index is below the threshold guidelines safe harbor.* Based on IDC's data, the post merger HHI is 286 to rule an HHI delta of 33.08. Thus, the HHI and the delta are well below the measure threshold in the Horizontal Guidelines.
- *Oracle's and Sun's middleware sales different results.* While both Oracle and Sun have middleware offerings in many middleware programs, as listed in Section 6 above, as described in that same section (paragraph 115), Oracle's overlapping products tend to offer more advanced functionality than Sun's middleware offerings and have a focus on scalability.

¹¹ Consistent with the requirement of the merger statute and the relevant regulatory rules, the nature of competition between the two companies is not relevant.

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reliability and robustness that makes them more suitable for mission-critical deployments.

- ***Oracle and Sun are not particularly close competitors in middleware.***
The sales opportunity data available to Oracle for different middleware products (application servers, portals, BPMS), which is analysed and presented below strongly supports the conclusion that Oracle's and Sun's middleware offerings rarely compete head to head. This conclusion is also supported by the technical comparison of Oracle's and Sun's middleware products, included in Section 6 above.

Out of 5,787 middleware transactions in the EU, Sun was mentioned as a primary competitor in 34 transactions (0.59%) and as a primary or secondary competitor in 65 transactions (1.12%). Sun was not a primary competitor in any of the key deals in this category.

Oracle's two main competitors in this segment were Microsoft and IBM. Microsoft was a primary competitor in 755 transactions (13.05%), over 20 times more often than Sun. IBM was a primary competitor in 709 transactions (12.25%), also over 20 times more often than Sun. Microsoft and IBM were specified as primary competitors in 18.52% and 22.96% of the key deals, respectively. Both IBM and Microsoft had a higher success rate than Sun when competing against Oracle, winning 30%-40% of the time compared to Sun's success rate of 25%-30%.

Similar results apply to worldwide transactions. Sun was a primary competitor in 0.40% of the transactions, and a primary or secondary competitor in 0.71% of the transactions. IBM was a primary competitor in 14.51% of the transactions, while Microsoft was a primary competitor in 8.82% of the transactions.

As a robustness check, the Oracle also analysed a much broader set of middleware sales opportunities that involved all products classified as "License/Middleware". There were 15,976 transactions in the EU in this category, and Sun was a primary competitor in 155 transactions (0.97%). Microsoft was a primary competitor in 2,010 transactions (12.58%), while IBM was a primary competitor in 1,594 transactions (9.98%).

As with databases, the table below presents the results of ignoring the occurrences of "Unspecified", "Unknown", "Unidentified" or "none" in the primary competitor field. That approach leads to the following data:

$$x = \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \right) = \frac{1}{2}$$
[illegible]

Model	Model	Model	Model	Model	Model
Model	Model	Model	Model	Model	Model
1.0	1.0	1.0	1.0	1.0	1.0
2.0	2.0	2.0	2.0	2.0	2.0
3.0	3.0	3.0	3.0	3.0	3.0
4.0	4.0	4.0	4.0	4.0	4.0
5.0	5.0	5.0	5.0	5.0	5.0
6.0	6.0	6.0	6.0	6.0	6.0
7.0	7.0	7.0	7.0	7.0	7.0
8.0	8.0	8.0	8.0	8.0	8.0
9.0	9.0	9.0	9.0	9.0	9.0
10.0	10.0	10.0	10.0	10.0	10.0

The independent categories were a somewhat blurry comparison. The considered category could contain an increasing number of subcategories (e.g., for instance, for BMD, one could distinguish between various degrees of BMD, and a further level, such as BMD_{max}).

∴ $\Delta G_{\text{total}} = \Delta G_{\text{system}} + \Delta G_{\text{surroundings}}$

17. *What is the difference between a "good" and a "bad" company?* See the "Company Profile" section of the *Business* section of the *Wall Street Journal* for a list of the top 100 companies in the world. The list is available at <http://www.wsj.com>.

1. The first part of the report is a summary of the work done during the year. It is a very good summary and gives a clear picture of the work done. It is well written and easy to read. It is a very good summary and gives a clear picture of the work done. It is well written and easy to read. It is a very good summary and gives a clear picture of the work done. It is well written and easy to read.

χ^2 -STATISTIK FÜR DIE VERGLEICHUNG VON ZWEI UNABHÄNGIGEN GRUPPEN

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The market grew by 9% in 2007. EMEA revenues accounted for approximately 35.4% of worldwide revenues.⁹⁴ IDC's definition of "Application Server Middleware" includes revenues related to application servers and TPMs in light of the fact that there is a significant overlap in the functionality offered by both products. With regards to the middleware software platform category, IDC estimates that it was worth USD 3.6 billion (approximately EUR 2.6 billion) in 2007.⁹⁵ The growth from 2006 was 9%. EMEA revenues accounted for 34.7% of worldwide revenues.

152. *Vendor shares.* The table below shows the shares (by revenue) of Oracle and Sun and other players on a worldwide basis for application server middleware for 2006 and 2007 as estimated by IDC:⁹⁶

Table 7: Application Server Middleware worldwide shares by vendor 2006-2007

Application Server Middleware share (%)		IDC ⁹⁷	
Vendors		2006	2007
1	IBM	42.8	42.9
2	Oracle	27.5	27.8
3	Microsoft	8.2	8.3
4	Fujitsu	2.4	2.8
5	Hitachi	2.2	2.2
6	Sun	1.6	1.2
7	Others	14.4	14.8
Total		100	100

Source: IDC, *Worldwide Application Server Middleware 2007 Vendor Shares*, August 2008.

153. The table below shows the shares (by revenue) of Oracle and Sun and other players on a worldwide basis for application server software platform for 2006 and 2007 as estimated by IDC:⁹⁷

⁹⁴ IDC attributes 35.4% of the applications server middleware revenues to EMEA countries amounting to USD 1,974.5 million (approximately EUR 1,423.0 million).

⁹⁵ IDC, *Worldwide Application Server Middleware 2007 Vendor Shares*, August 2008.

⁹⁶ As discussed above in Section 6, these figures significantly under-represent the market success of Microsoft and open source in this area.

⁹⁷ As discussed above in Section 6, these figures significantly under-represent the market success of Microsoft and open source in this area. ASPP is a sub-segment of the ASM category, on which IDC currently reports.

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Table 4 Application server Software Platform worldwide shares by vendor 2006-2011

Vendor	2006	2007	2008	2009	2010	2011
Oracle	24.5	24.5	24.5	24.5	24.5	24.5
IBM	12.8	12.8	12.8	12.8	12.8	12.8
Microsoft	11.1	11.1	11.1	11.1	11.1	11.1
Other	5.6	5.6	5.6	5.6	5.6	5.6
Sum	54.0	54.0	54.0	54.0	54.0	54.0

Source: IDC, Worldwide Application Server Platforms 2007-2011, Forecast Update August 2011

(c) *Countdown effects.* The Transaction will not significantly impede effective competition in the application server segment.

- Sun's application server share only marginally adds to Oracle's position. According to IDC pre-Transaction, the combined Oracle/Sun entity would have a share of 35% in application server worldwide. In turn, the market leader IBM (market share of 12.8%) in the application server software platform market, the combined entity would have a market share of 25.4%, with IBM posing an increasingly serious challenge with a market share of 25.4%. Microsoft is also a significant player in the market with a market share of 11.1%. IDC is more likely an overstatement Oracle's share by counting vendors that are not purely application server related (as derived from products in a broad bundle, such as the Enterprise Edition of Oracle's application server) – also, it is to be noted that application server software platform products are only part of the application server software market, at which IBM is by far the market leader. In any case, Sun represents a very small part of either market and the Transaction does not change the competitive landscape. Oracle will continue to face fierce competition from Microsoft, IBM, Fujitsu and others, including open-source competitors not featured in IDC's report, such as JBoss and Apache Tomcat.

- *HCI data is below the Horizontal Guidelines' safe harbor.* Even on the basis of IDC's highest attributed Oracle share, the pre-Transaction HCI is approximately 24.2 according to IDC, with an HCI delta of 14.4 below the 39.0 threshold mentioned in the Horizontal Guidelines.

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- ***Oracle's and Sun's application servers serve different needs.*** While Oracle's application server and Sun's application server both comply with the Java EE specification (Java EE 1.5, to be specific), as discussed in paragraph 115 above, Oracle's application server responds to different needs; they are thus not particularly close substitutes.
- ***Oracle and Sun are not close competitors in application servers.*** Oracle and Sun are not each other's closest competitors for any identifiable set of customers. Instances of head-to-head competition between Oracle and Sun are much less frequent than instances in which Oracle and Sun compete with other vendors. Thus, out of 2,544 application server transactions in the EU, Sun was mentioned as a primary competitor in 17 transactions (0.67%) and as a primary or secondary competitor in 20 transactions (0.79%). Sun was neither a primary nor a secondary competitor in any of the key deals in this category. Oracle's two main competitors in this segment were, again, IBM and Microsoft. IBM was a primary competitor in 14.11% of the transactions – over 20 times more often than Sun – while Microsoft was a primary competitor in 6.84% of the transactions. IBM and Microsoft were involved in 28.07% and 12.28% of the key deals, respectively. Both IBM and Microsoft had a higher success rate than Sun when competing against Oracle, winning 35%-40% of the time compared to Sun's success rate of 20%-25%. In addition to IBM and Microsoft, at least two additional competitors were specified as primary competitors more frequently than Sun: Red Hat and SAP.

Similar results apply to worldwide transactions. Sun was a primary competitor in 0.39% of the transactions, and a primary or secondary competitor in 0.48% of the transactions. IBM was a primary competitor in 14.53% of the transactions, while Microsoft was a primary competitor in 3.37% of the transactions. Moreover, application servers, like other middleware components, are very often sold to customers not alone but as part of a wider bundle. There are a great number of component combinations a customer may be interested in buying from a middleware vendor. This makes it even more unlikely that Oracle would compete head-to-head with Sun on deals that only relate to application servers.

- ***The combined entity will continue to face strong competition from a number of powerful sources,*** including IBM and Microsoft, and open-source providers (*e.g.*, Apache, Red Hat, Caucho Software, Jetty Software, Iona Software and IBM WebSphere Community Edition (Geronimo)). Moreover, emerging platforms (such as Spring, Open Standards Gateway Initiative and Struts) offer an alternative application deployment approach that does not require a Java EE application server.

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In addition, please identify software licensed or programming set licenses and copyrights such as Fortran, Basic, PASCAL, C++, and C++ (and C++/C) for coding using the available and appropriate software languages.

11.4. Market Products:

- 11.4.1. **Market size.** The size of the emergency portal software market in 2007 was estimated at USD 1.3 billion (approximately EUR 0.86 billion) according to IDC.¹¹ The market grew by 18.7% in 2007. VMware technology accounted for approximately 33.2% of worldwide revenue.
- 11.4.2. **Market shares.** The total backup market was shared by revenues of Oracle and Sun and other players on a worldwide basis. For example, by 2006, the IDC market estimated for IBM:

Table 11. Emergency Portal Software Worldwide Shares by Vendor 2006-2007

Emergency Portal Software Worldwide Shares by Vendor 2006-2007				
Rank	Vendor	2006	2007	2008
1	IBM	18.7%	18.7%	18.7%
2	Sun	18.7%	18.7%	18.7%
3	Oracle	18.7%	18.7%	18.7%
4	VMware	18.7%	18.7%	18.7%
5	Microsoft	18.7%	18.7%	18.7%
6	Other	18.7%	18.7%	18.7%
Total		100%	100%	100%

Source: IDC, Worldwide Emergency Portal Software 2006-2007, 2008 and 2009, and 2010 Forecast. Downloaded from IDC website: 11-11-2012.

- 11.4.3. **Competitive efforts.** The Transmission will not significantly compete effective competition in the portal software market.
- 11.4.4. **The addition of new portal products does not significantly strengthen Oracle's share in the market.** As noted above, the acquisition of Sun would add only 1.1% to Oracle's portal product share for a total share of 19.7%. Known as IBM (18.7%), Microsoft (18.7%), SAP (18.7%) and Computer Associates (18.7%) increased Sun's market share.
- 11.4.5. **IBM share is below the horizontal threshold of 18.7%.** Based on IDC data, the post-Transmission IBM is approximately 18.7%, with an 18.7%

¹¹ *Worldwide Emergency Portal Software 2006-2007, 2008 and 2009 Forecast and 2010 Forecast.* Downloaded from IDC website: 11-11-2012.

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delta of 165. According to the analyst, the delta is well below 250, *i.e.*, the safe harbour applied by the Commission to markets with an HHI between 1000 and 2000.

- ***Oracle's and Sun's portal products serve different needs.*** As set out in paragraph 115 above, Oracle's and Sun's portal products are not particularly close substitutes from a product-feature perspective.
- ***Oracle and Sun are not particularly close competitors in portal products.*** The fact that Sun and Oracle products are not competing closely in this segment is confirmed by the sales opportunity data analysis. Out of 242 portal transactions in the EU, Sun was never mentioned as either a primary or a secondary competitor. Oracle's top competitors in this segment were IBM, Microsoft and SAP. These companies were mentioned as primary competitors in 11.16%, 6.2%, and 3.72% of the transactions, respectively. The average revenue for transactions in which IBM and Microsoft were primary competitors was USD 1.2 million. (IBM) and USD 1.3 million. (Microsoft), significantly higher than the average revenue of portal transactions, which was less than USD 0.5 million.

Similar results apply to worldwide transactions. Out of 940 portal transactions, Sun was never a primary competitor and was only twice (0.21% of all transactions) a secondary competitor; Sun lost these two transactions to Oracle. IBM, Microsoft and SAP were the three leading competitors worldwide.

- ***The combined entity will continue to face strong competition from IBM, Microsoft and SAP.*** All major solution vendors offer a portal product, and there are several pure-play product vendors. Both IBM and Microsoft are strong competitors in this space. IBM has a huge installed base in portals across a wide range of complex deployment patterns and Microsoft takes full advantage in this space of its ability to leverage ubiquitous parts of its software portfolio to push its portal product. Microsoft's strategy in this area is to bundle its portal with Windows SharePoint Services and Office SharePoint Server 2007.

In addition to IBM and Microsoft, SAP is also a significant player in portals, especially for enterprises that are already SAP application customers. Tibco, a Gartner "visionary" in this area, is using its strengths in complementary areas such as BPMS and application integration to expand in portals. There are other pure-play competitors focussed on portals, such as Vignette and Broadvision.

- ***The Portals segment is competitive and is one that is clearly affected by the push towards SOA and Web 2.0.*** Analysts recognise portals as one

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of the areas with the most potential for a Web 2.0-oriented turn-up to focus on. These vendors describing themselves as providing "market" capabilities. It is also a space in which a major mainstream Internet-based presence such as page provider, such as Google, could become more active and offer a competitive service up.

(iii) **ESB software**

158 **Market size.** The size of the ESB segment in 2007 was estimated at USD 1.4 billion (approximately EUR 1 billion) according to IATA⁴⁴. The market grew 41.1% in 2007. IATA's estimates according to approximately 18.6% of worldwide investment.

159 **Market leaders.** The table below shows the share of the market of Oracle and SAP and other players on a worldwide basis for ESB for 2006 and 2007 as estimated by IATA.

Table 10: Enterprise Service Bus and Connectivity Software Worldwide Market in 2006-2007

Company		2006	2007
Oracle	Share	11.0%	15.0%
SAP	Share	11.0%	15.0%
Other	Share	78.0%	70.0%
IBM	Share	1.0%	1.0%
Microsoft	Share	1.0%	1.0%
Other	Share	66.0%	82.0%
Other	Share	23.0%	23.0%
Other	Share	1.0%	1.0%

Source: IATA, "Enterprise Service Bus Software 2006-2007 Market Update and 2007 Market Share Forecast Update" Jan 2008

160 **Competitive effects.** The transaction will not significantly impose effective competition to the ESB software segment.

- **IATA would remain the market leader by a significant margin.** The combination of Oracle and SAP in ESB software would create a merger

⁴⁴ IATA, "Enterprise Service Bus Software 2006-2007 Market Update and 2007 Market Share Forecast Update" Jan 2008.

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challenger to IBM, which currently has almost twice the ESB revenues of the nearest challenger, Oracle, and which would remain ahead of the combined Oracle/Sun entity. IBM had 60% growth in 2007. The segment generally is witnessing explosive growth, with multiple competitors, such as Software AG, TIBCO and SAP, well placed to capture share. SAP, for example, was the growth leader in 2007, with a growth of 428%. IDC underlines also the strong competition from open source ESBs. Indeed, according to IDC, “mule,” managed by MuleSource, and “Jboss,” managed by Red Hat, are strong enough to be considered good alternatives to commercial solutions.¹⁰⁰

- ***HHI delta is below the Horizontal Guidelines’ safe harbour.*** Based on IDC data, the post-Transaction HHI is approximately 1378 with an HHI delta of 189. The delta is well below 250, *i.e.*, the safe harbour that the Commission applies to markets with a post-Transaction HHI between 1000 and 2000.
- ***Oracle’s and Sun’s ESB software serve different needs.*** As detailed in paragraph 115 above, from a technical standpoint, the offerings of the Parties in this area are not close substitutes.
- ***Oracle and Sun’s are not particularly close competitors in ESB software.*** As is the case with all other middleware segments and database software, Oracle does not compete closely with Sun in the ESB space. Oracle does not have any data related specifically to ESB, but the data presented below in paragraph 163 in relation to BPMS can be considered a useful proxy, because ESB and BPMS are both segments of what can broadly be called integration and process automation middleware.
- ***The combined entity will continue to face strong competition from Software AG, Tibco and SAP, among others.*** All major enterprise software vendors are represented in the ESB segment, including IBM and Microsoft, as well as various open-source solutions and numerous other pure-play middleware vendors. All major vendors see ESB as an important piece of their future strategies and it is certain that the segment has potential for both new entry by start-ups and for repositioning by existing vendors such as Microsoft, which bundles ESB-type functionality with its Windows Server.

(v) Process Automation Middleware (BPMS)

¹⁰⁰

IDC, *Worldwide Enterprise ESB Software 2008-2012 Forecast Update and 2007 Vendor Shares: A new Landscape*, July 2008.

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- (5) **Market size.** The size of the B2BMS market in 2007 was estimated to 100 percent to total about 1 billion to 1.5 billion Australian dollars, or ¹⁰¹ \$1 to USD 2.2 billion, approximately EUR 1.04 billion.¹⁰² The market grew by 10.6% in 2007. The B2BMS investment accounted for approximately 32.2% of worldwide investment.
- (6) **Investor shares.** The table below shows the change (by movement) of Oracle and Microsoft's share of the worldwide market for B2BMS for 2006 and 2007 as measured by IDC.

Table 11. Investor Acquisition of B2BMS worldwide market share for Oracle 2006-2007

Investor	Share of B2BMS Investment in 2006	Share of B2BMS Investment in 2007	
		2006	2007
Oracle	32.2%	32.2%	32.2%
Microsoft	32.2%	32.2%	32.2%
Other	35.6%	35.6%	35.6%
Total	100%	100%	100%

Source: IDC, *Worldwide Business-to-Business Software 2007 Vendor Share*, November 2008.

- (7) **Competitive effects.** The transaction will not significantly impact effective competition in the B2BMS markets.

- The addition of Sun's B2BMS products does not significantly strengthen Oracle's share in this market. As noted above, the acquisition of Sun would add only 2.3% to Oracle's postal products share, for a total share of 17.2%. Rivalry in B2BMS is strong, with SAP (10.4%) and IBM (10.4%) all having more significant market positions than Sun. The Parties combined 17.2% share post transaction would be only a marginal increase.*

¹⁰¹ See IDC, *Worldwide Software 2007*.

¹⁰² IDC, *Worldwide Business-to-Business Software 2007 Vendor Share*, November 2008.

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the affected market threshold and significantly below the 25% share threshold mentioned in the horizontal guidelines.

- ***HHI delta is below the Horizontal Guidelines' safe harbour.*** Based on IDC data, the post-Transaction HHI is approximately 689 with an HHI delta of only 73. Both the HHI and the delta are so well below the thresholds in the Commission's Horizontal Guidelines that no concerns could conceivably arise.
- ***Oracle's and Sun's BPMS serve different needs.*** As noted in paragraphs 115 Oracle's and Sun's BPMS focus on different needs, which results in both offerings not being particularly close in terms of product substitutability.
- ***Oracle and Sun's BPMS are not particularly close competitors in ESB software.*** Sun rarely, if ever, appears as a primary or secondary competitor of Oracle in BPMS. Out of 164 BPMS transactions in the EU, Sun was never mentioned as a primary competitor. Sun was a secondary competitor in one transaction (0.61% of all transactions), which it lost to Oracle. Oracle's top competitors in this segment are IBM, Microsoft, and Tibco. These companies were mentioned as primary competitors in 25%, 10.98%, and 5.49% of the transactions, respectively. The average revenue for transactions in which IBM and Microsoft were primary competitors was USD 1.6m. (IBM) and USD 3.7m. (Microsoft), significantly higher than the average revenue of BPM transactions, which was less than USD 1m.

Worldwide, Sun was mentioned as a primary competitor on 5 out of 669 occasions (0.75% of the time) and as a secondary competitor on two occasions. Again, IBM, Microsoft, and Tibco were the three leading competitors worldwide.

- ***The combined entity will continue to face strong competition from IBM, ACS and Tibco, among others.*** Moreover, major software players such as SAP, Microsoft and Adobe are all represented in this space, as are numerous smaller vendors accounting for almost 50% of the market. The space is highly dynamic and susceptible to entry due to new sales opportunities created by the move towards SOA. The BPMS market, the boundaries of which are extremely fluid, is far from a mature category and the relevant technology has only been available for around five years and is only now gaining mainstream market adoption.

A.2 Discussion of coordinated effects

164. ***Generally.*** Software markets – including the markets for databases and middleware – are not generally conducive to coordinated effects, as a result

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of the following inherent market features: (i) the differentiated nature of software products; (ii) the substantial non-published discounts granted off list prices; (iii) the number of credible potential vendors; and (iv) the importance of innovation in these markets.

165. **Database.** Coordinated effects are unlikely to occur in the market for database for the following reasons:

- ***The combination of Sun's MySQL and Oracle does not change the fundamental characteristics of the market.*** The database market is highly competitive and will continue to be post-Transaction. Sun MySQL has an insignificant market presence, and because it is open-source, it is easily replicated – indeed, it has been replicated, *e.g.*, by MariaDB. There is no evidence to suggest that the current conditions of fierce competition between the database players will be altered in any way as a result of the transaction.
- ***The customers for database software are sophisticated.*** The customers for database solutions tend to be enterprises and government entities, *i.e.*, sophisticated and complex purchasers.
- ***Pricing and terms are intransparent.*** Database is sold in a variety of ways, often in the context of transactions involving different types of software, support and maintenance. Discounts are applied by different vendors on different bundles, often on a blended basis (*i.e.*, on the price of the bundle rather than on the price of each individual component of the bundle).
- ***Products are heterogeneous.*** Database products support a range of features and are significantly differentiated. This makes it difficult for competitors to monitor each other's prices for different features and also renders any coordination on prices or output necessarily more complex.
- ***Lack of credible punishment possibilities.*** As customers choose database products on the basis of many features (both of the products and of their own situations) other than price, there is no real prospect of a "price war" or the like as a means of retaliation for "cheating".
- ***Innovation plays an important role.*** Competition between database products, as with all software, is characterised by a high degree of

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innovation, which would render attempts at coordination among rivals inherently unstable.¹⁰³

166. **Middleware.** Similarly, coordinated effects are unlikely in any of the markets for middleware (including in particular, application servers, portal products, ESB software and BPMS) as a result of the Transaction for the following reasons:

- ***Lack of transparency due to product differentiation.*** Middleware solutions are highly differentiated. Customer requirements and preferences vary widely and depend on a host of difficult-to-categorise, customer-specific factors such as the customer's size, the applications they wish to use, the legacy software systems already in place at the customer and the customer's industry. Some vendors' product offerings focus on narrow segments which are just emerging (such as ACI in BPMS), others offer best-of-breed middleware solutions (such as Tibco) and others place an emphasis on integration of the various layers of the stack (*e.g.*, Microsoft, SAP and Oracle).
- ***Lack of transparency due to nature of discounts.*** Pricing for middleware solutions is completely non-transparent. Regardless of the middleware product involved, vendors use very different metrics and grant substantial non-transparent discounts on published prices; pricing is typically agreed in bilateral negotiations between suppliers and customers. The fact that discounts are applied by different vendors on different bundles, often on a blended basis makes it even more difficult to compare prices between vendors. In fact, most vendors do not even publish price lists. While Oracle is an exception to that rule (*i.e.*, Oracle does publish price lists), its list prices bear no relation to actual transaction prices, particularly for the larger deals.
- ***A large number of credible vendors for middleware are present.*** There are a number of credible vendors for middleware of all kinds of breadth and depth, each with unique strengths. The list of alternative providers include major software providers (such as IBM, Microsoft and SAP), larger numbers of open-source solution providers and point-product vendors (such as Swift, ACI Worldwide, Software AG and Pegasystems).

¹⁰³ See, *e.g.*, Ivaldi, Marc, Bruno Jullien, Patrick Rey, Paul Seabright, and Jean Tirole, "The Economics of Tacit Collusion: Implications for Merger Control," *The Political Economy of Antitrust*, Ed. Vivek Ghosal and Johan Stennek, Elsevier Science, pages 217-240 ("innovation, particularly drastic ones, may allow one firm to gain a significant advantage over its rivals. This prospect reduces both the value of future collusion and the amount of harm that rivals will be able to inflict if the need arises").

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- ***Asymmetry of market shares.*** The middleware market is both fragmented and characterised by a high degree of asymmetry in the market shares of the different players.
- ***Asymmetry in strategic focus.*** There are fundamental differences in the ways in which the various vendors approach the software stack, hence in their respective strategic priorities. For example, IBM offers no pre-packaged enterprise applications, while SAP offers no database; Microsoft is the vendor with the most significant presence in operating systems. There are also differences in the extent of the middleware offerings of the various vendors. Any one of the products in the affected middleware markets (application servers, portals, ESB and BPMS) is typically only one element (and often a relatively minor one) of the set of products these vendors are offering to customers. Moreover, the vendors' overall competitive strategies are typically not driven by the prospect of selling an isolated middleware product such as an application server or an ESB, but by other products and the revenues available from them. For instance, SAP seeks to offer middleware primarily as an adjunct to sales of its own applications, while Microsoft has integrated certain middleware functionality (including application server) into its OS. Open-source vendors focus on consulting services and maintenance rather than new license sales since their software is non-proprietary. A fundamental asymmetry in incentives exists as a result of these differences in strategy and product range. As a consequence, the notion that there could be some kind of coordination of behaviour in respect of the sale of any middleware component is implausible, given the importance of each vendor's overall offering in determining how it goes to market.
- ***Lack of credible punishment possibilities.*** A further consequence of the high level of product differentiation and customer-specific preferences for middleware is that there is no credible prospect of "punishment" in response to unilateral deviations from a hypothetical coordinated outcome. Since customers choose middleware products on the basis of many features (both of the products and of their own situations) other than price, there is no real prospect of a "price war" or the like as a means of retaliation for "cheating." Without a credible threat of such retaliation, there can be no incentive for the market participants to adhere to any coordinated behaviour, even if other market characteristics were to favour it.
- ***Importance of innovation.*** Similar to database products, the importance of innovation for competition between middleware products would render attempts at coordination among rivals as inherently unstable.

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167. In conclusion, coordinated effects can readily be excluded in the database and middleware markets.¹⁰⁴

**B. VERTICALLY AFFECTED RELEVANT MARKET:
DEVELOPMENT ENVIRONMENTS**

Introduction to Java. As noted above at paragraph 104, Java is a development environment (including a programming language and tools), allowing developers to write software applications.

168. Java is attractive to developers because:

- Java is operating system and hardware neutral. One of the key principles applied from the first days of Java's design was "write once, run anywhere". This allows developers to produce a single version of an application that will run on any operating system and hardware combination (platform) for which a Java virtual machine has been created, and have confidence that it will run in the same way on each operating system and hardware combination.

Developers using Java to write applications require no Java licence.

There are several alternative programming languages to the Java language¹⁰⁵ for companies currently using the Java development environment: (i) C or C++ programming languages; or (ii) a variety of dynamic languages – PHP¹⁰⁶, Ruby on Rails¹⁰⁷, Grails¹⁰⁸, Python¹⁰⁹ or PERL¹¹⁰, for example.

¹⁰⁴ See also to this effect Case COMP M.5080 Oracle/BEA, paragraph 33: "...[I]n view of the specific characteristics of software markets, the merger would not be conducive to coordinated effects either. Should the new entity and IBM behave in such a way, numerous competitors as listed above (SAP, Sun, Microsoft and open source providers) would have the means to exert a competitive constraint. In addition, middleware solutions are differentiated products, and their pricing is nontransparent, also because of the number of vendors and their practice to apply discounts on public prices which are agreed typically on bilateral negotiations. As a consequence, price comparison between similar products is difficult. Therefore, the proposed transaction is unlikely to give rise to any coordinated effects, in particular between IBM and the merged entity."

¹⁰⁵ Each of these programming languages/development environments consists of a Tool/Development Environment for developers to build applications in that programming language; a set of class libraries that provide utilities and a programming interface (API) specification through which applications can be built; and an application server that runs these programming languages.

¹⁰⁶ PHP is a widely used, general purpose scripting language that is especially suited for web development and can be embedded into HTML. See www.php.net. PHP is a widely-used general-purpose scripting language that is especially suited for Web development and can be embedded into HTML. PHP is a widely-used general-purpose scripting language that is especially suited for Web development and can be embedded into HTML. PHP is a widely-used general-purpose scripting language that is especially suited for Web development and can be embedded into HTML. See www.php.net.

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Switching to another language could generate problems of compatibility between versions of software preceding the switch and those immediately following. However, once the software in question was moved to another language there would be no issues with compatibility between that version and succeeding versions.

169. The main alternative development environment is Microsoft .NET, which relies on the Visual C# or Visual Basic languages).
170. **Market size.** There is no reliable metric as to the market size for development environments. The Parties can therefore provide no such estimates.
171. **Vendor shares.** IDC does not provide market shares (either by revenue or installation) for development environments such as Java or Microsoft's .NET. The closest approximation available is the results from surveys conducted by IDC and InfoTech Research Group. In IDC's study,¹¹¹ sponsored by Microsoft, survey participants were asked about application platforms in their respective companies. As illustrated in Figures 3,4 and 5, Microsoft's .NET and Java were the most commonly named application platforms deployed (or expected to be deployed) by the surveyed subjects.

¹⁰⁷ Ruby on Rails is an open source web application framework for the Ruby programming language. See www.rubyonrails.org.

¹⁰⁸ Grails is an open source web application framework which leverages the Groovy programming language. See www.grails.org.

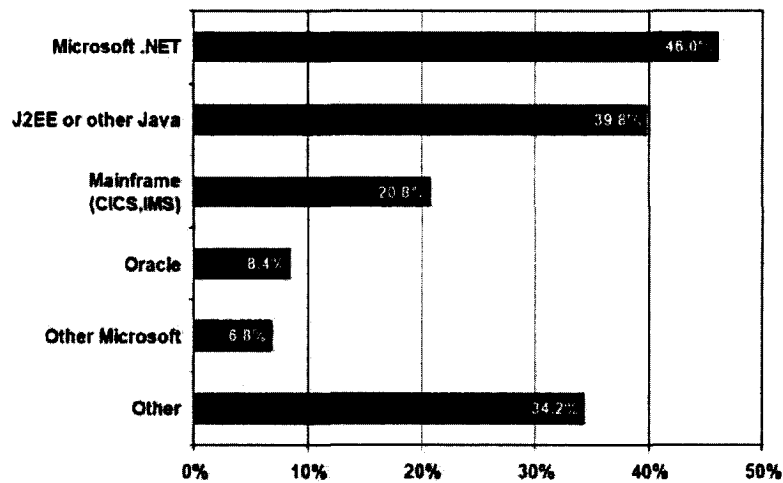
¹⁰⁹ Python is a general-purpose high-level programming language. The language has an open, community-based development model managed by the non-profit Python Software Foundation, which maintains the *de facto* standard definition of the language in Cpython, the reference implementation. See www.python.org.

¹¹⁰ Perl is a high-level, general-purpose, dynamic programming language. See www.perl.org.

¹¹¹ IDC, *2007 Mission Critical North American Application Platform Study*, August 2007

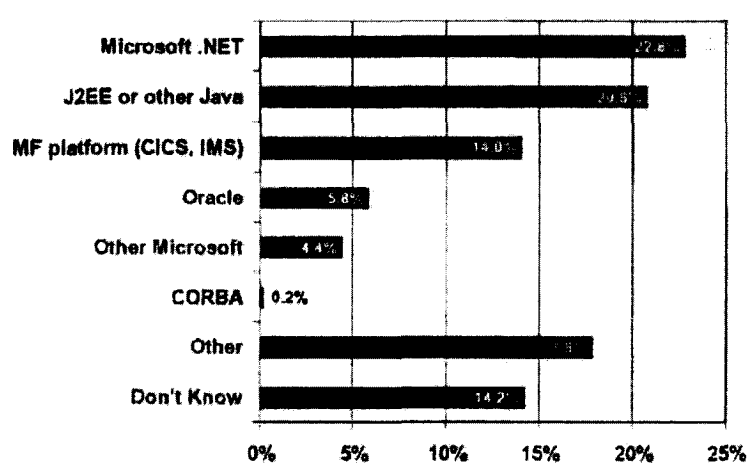
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Figure 3: Application Platforms used for mission critical applications within surveyed enterprises



Source: IDC, 2007 Mission Critical North American Application Platform Study, August 2007.

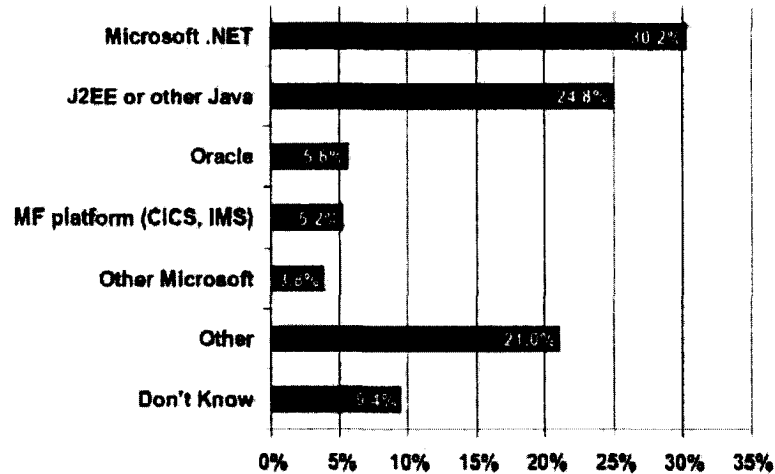
Figure 4: Primary Application Platform used for mission critical applications within surveyed enterprises



Source: IDC, 2007 Mission Critical North American Application Platform Study, August 2007.

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Figure 5: Primary Application Platforms for future development



Source: IDC, 2007 Mission Critical North American Application Platform Study, August 2007

Data collected by InfoTech is consistent with IDC's identification of .NET and Java as the primary development environments, although InfoTech identifies a wider gap between .NET and Java.¹¹² InfoTech collected data from approximately 2000 enterprises to identify their preference of application development environment. The options included: 'Exclusively .NET,' 'Primarily .NET,' 'Primarily Java,' 'Exclusively Java' and 'Other'. InfoTech's research found that 61% of all enterprises surveyed focused either primarily or exclusively on .NET as an application platform, while only 23% of those surveyed standardised primarily or exclusively on Java. InfoTech concluded that "NET is far more popular than Java regardless of enterprise size or industry sector [...] It is currently the preference of most enterprises." Despite an almost 20 year head start, Java has rapidly lost its leadership position to Microsoft's .NET platform.

The use of Microsoft.NET within a single enterprise does not exclude the possibility for the same enterprise to use Java. There are generally three types of enterprises: (i) those that use Microsoft.NET exclusively because the customer has made an internal decision to standardize on the Windows server operating system and wants to train its software developers on a single programming language; (ii) those that have a variety of different operating systems including Windows and uses both Microsoft.NET and Java for different information technology projects within the enterprise; and (iii) those that use exclusively Java. The reason that most enterprises appear to fall into

¹¹² InfoTech Research Group, *Its Official: .NET Roasts Java's Beans*, 2007.

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category 1 or category 3 is driven by the fact that they want to standardize their software development practices on a single technology to make it easy for them to train their software developers, which allows them to collaborate with other developers in their organization more easily, and makes it easier on the enterprise to maintain their existing systems. Many enterprises choose to use a combination of Java and Microsoft.NET for different projects. The choice is often driven by a variety of factors including: (i) the familiarity of the software development team with a particular language; (ii) the choice of operating system on which the program that is being developed is to be operated (Microsoft.NET does not run on any other operating system other than Windows); and (iii) whether the organization wants to choose software from a variety of vendors or whether it does not want or need such flexibility.

However, it is also clear that enterprises are also driven towards .NET by the substantial degree of technical integration and bundling between Microsoft's dominant products and technologies.

172. **Competitive effects.** The Transaction will not enable much less incentivise Oracle to foreclose competing providers of enterprise software. Any suggestion that Oracle would have incentives to "limit" the availability and the development of the Java platform for its competitors in the middleware and applications markets misunderstands a few key facts, which, when properly understood clarifies that Oracle has no ability and no incentive to limit the availability and development of Java. Moreover, as analysed in further detail below, the position Sun has taken in its dispute with Apache Harmony does not suggest otherwise.

- **Oracle lacks the ability to foreclose: as the "owner" of Java it would not be able unilaterally to impose its views on the future development of Java any more than Sun currently is able to.** Neither Oracle nor Sun has, nor will they have, the ability to unilaterally limit the availability and the development of the Java platform for its competitors in the middleware and application markets, for the following reasons:

1) *With respect to licensing, as discussed above at paragraph 90 to 93, the JCP imposes significant constraints on what Sun (or Oracle) can and cannot do.* In particular, the terms of the JSPA require Specification Leads (such as Sun) to license TCKs on fair, reasonable and non-discriminatory terms:

- i. Section 5.F.I. of the JSPA provides that the Specification Lead must offer to any interested party licences concerning the Reference Implementation and TCK on terms that are fair, reasonable and non-discriminatory.

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- ii. Section 5.F.II. provides that the licence terms offered by the Specification Lead shall include rights to the Specification Lead's copyrights and the right to copy and modify the source code of the Reference Implementation and to distribute the Reference Implementation as part of a complete binary implementation of the corresponding Specification that satisfies the compatibility standards.
- iii. Section 5.F.IV. provides that the Specification Lead cannot limit the scope of licenses granted under Section 5.F. beyond limitations restricting the distribution of products derived from the Reference Implementation that do not satisfy the compatibility standards:

"The Spec Lead shall not include as part of the foregoing license any additional contractual condition or covenant concerning compatibility that would limit or restrict the rights of any licensee to create or distribute products derived from the [Reference Implementation]."

As already mentioned, a licensee that satisfies the compatibility requirements set forth in Section 5.B (a) – (c) of the JSPA must be granted a TCK licence on fair, reasonable and non-discriminatory terms. Any change in a technical specification that could possibly impede competitors products, would have to pass the JCP Executive Committee vote without which it cannot take effect. In this voting process, Oracle today has and will in the future have only one vote and the Executive Committee will include a number of vendors who would be disadvantaged by—and therefore would vote against—such a strategy.

- 2) *Competitors in the middleware and application markets can use the Java Runtime Environment (JRE) without any form of license from Sun or Oracle, thereby precluding any ability to limit the availability of J2SE technology to them. Competitors also have the ability to use the source code of the Open JDK implementation of the J2SE specification under the GNU Public License, with no need to take a commercial Java license. In other words, as these technologies are available without license from Sun (or Oracle), Oracle has no ability to limit the availability of J2SE technology to competitors.*
- 3) *Any attempt to either technically limit or contractually limit the availability of application server technology to competitors would have to pass the vote of the JCP Executive Committee and also have*

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to affect all other participants uniformly, not just a specific provider or providers. Since there are many other commercial and open source providers of J2EE Application Server technology, to affect any competitor, Oracle would have to change the structure of the JCP to essentially become a single source provider of Java Application Server technology because any 'biasing' would affect all other vendors. Oracle essentially would have to dissolve the JCP, change the licensing structure for Java completely, and eliminate all participation in the development of Java standards. Eliminating the universal appeal of Java would jeopardize Oracle's multi-billion dollar applications and middleware businesses, as discussed immediately below.

- ***Oracle lacks incentives to foreclose*** in view of the following:
 - ***Java's success against Java lies in its widespread adoption.*** As noted above in Section 6, the competition between Java and .NET is one of adoption: the more customers and developers embrace a particular development environment, the more popular that environment becomes due to the increasing numbers of developers experienced in that platform, training resources, documentation, *etc.* It is the potential for .NET dominance that gives Oracle an enormous interest in the success of a unified, open Java standard. Oracle's USD 10 billion/year Fusion Middleware and Fusion Applications completely depend on the continued success and growth of Java as an open, unified standard. This is because Oracle's operating system-agnostic and "hot-pluggable" strategy rests on Java's "write once, run anywhere" design point. Oracle's dependence on standards-based Java ensures Oracle's commitment to Java.
 - ***The experience of UNIX is instructive and underscores Oracle's appreciation that Java must remain unified.*** UNIX began as an AT&T Bell Labs research project in 1969. Bell Labs continued to develop UNIX through the 1970s, producing several distinct evolutionary editions. These editions were licensed to universities, governments, and some commercial entities which were free to modify and redistribute the licensed UNIX editions.

Two notable early UNIX variants were BSD, a widely used academic version of UNIX developed by the University of California, and System III, a commercial UNIX variant developed by AT&T. UNIX became popular commercially during the 1980s when several computer manufacturers including Sun, IBM, HP, and Digital Equipment chose to support UNIX on workstations and

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servers. Each company began with an existing UNIX variant, usually some successor version of BSD or System III, and modified it substantially in order to create a differentiated computer system offering.

By the time UNIX became widely used, it was already fragmented. This occurred because there was no governing body or standards organization guiding the development of UNIX features and APIs. There was no body of test kits to assure consistency among operating systems referred to as "UNIX". The companies popularizing UNIX did not believe that a common UNIX implementation was in their commercial interest. AT&T, the original author of UNIX, did not devote sufficient resources to UNIX engineering to ensure that licensees would be best served by continuing to receive updates from AT&T.

Over the years, there were multiple attempts to create UNIX standards. Most of the efforts failed due to disagreements among computer manufacturers. One, called "POSIX", succeeded in defining a limited common API subset to which most UNIX (and many non-UNIX) operating systems adhere.

However, these APIs are not sufficient for implementing many sophisticated applications. ISVs, such as Oracle, still must invest significant resources to port applications to each UNIX variant it wishes to support. Oracle, like many other software companies, had very little to do with the development and fragmentation UNIX. Oracle helped popularize UNIX by (at substantial cost) making its software run on the UNIX variants produced by several computer manufacturers in the 1980s. However, Oracle had no practical ability to convince computer manufacturers to merge together their UNIX implementations, even though that would have been very much in Oracle's interest. Oracle's experience with UNIX serves as a reminder to Oracle, if one was needed, of the advantages of Java remaining unified.

- *Oracle's revenues at risk if Java fails and it were required to switch development environments range in the billions of dollars.* It is impossible to explicitly quantify what the damage to Oracle would be if Java were to fail. However, if one assumes that Oracle's Java-based applications and middleware businesses completed ceased to grow, Oracle can estimate the revenues at risk such a scenario, as shown below.

Annual Revenue at Risk (USD)
(License + Maintenance only – no consulting revenue)

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Annual Software Revenue for Fusion Middleware = \$3.8 bn

Annual Software Revenue for Oracle Applications = \$6.0 bn

Total Revenue at Risk = \$9.8 bn

It is also impossible to predict the future success of Oracle's products, so it is difficult to define how large the opportunities for Java-based products may be in the future. If, however, one were again to assume flat growth of Oracle's current indirect monetization of Java, the opportunities would also be in the order of USD10 billion annually.

- *The Apache licensing dispute does not suggest Sun or Oracle can limit the availability of Java in any way.* There is nothing about the Apache dispute that would suggest that Sun would be able to abrogate its fair, reasonable and non-discriminatory obligations or otherwise withhold a license to an otherwise compliant licensee based on the nature of the licensee's product. To the extent that Sun's position can be characterized as imposing a "field of use restriction", there is nothing about Sun's position in its dispute with Apache Harmony that would permit it to impose a "field of use restriction" selectively (in violation of its obligations under Section 5) against the products of individual companies (e.g., in a way that would permit Oracle to withhold a commercially reasonable license to use Java in an app server, database or other product).
 - *Background to the dispute.*¹¹³ The dispute between the Apache Software Foundation¹¹⁴ and Sun over Apache's Harmony implementation of Java SE is, at its core, a commercial

¹¹³ Attached at Annex 31b are internal Sun documents that substantively relate to the Apache dispute. These consist in two internal presentations discussing options for handling the dispute and issues relating to the JCP more generally. Annex 31b also contains a presentation given to the Executive Committee describing Sun's position on the Apache dispute (this is not an internal document but is provided as it offers a useful summary). Sun has not conducted an exhaustive email search on this subject.

¹¹⁴ Formed in 1999, the Apache Software foundation ("Apache") is an organization that "provides organizational, legal, and financial support for a broad range of open source software projects." <http://www.apache.org/foundation/> The goal of Apache is to develop and provide free, enterprise-grade software products through a collaborative process and to offer those products to users pursuant to the "pragmatic" Apache License. Apache has been a participant in the JCP since the creation of JCP version 2.0, and is a member of the Executive Committee for Java SE and EE.

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disagreement between a licensor (Sun), whose freedom of action is severely constrained by its membership in a standards-setting organization (JCP), and a licensee (Apache), who would allow downstream commercial users to benefit from royalty-free licenses to qualified not-for-profit organizations. The commercial users who stand to get a windfall in the form of a royalty-free Java SE license if Apache wins the dispute are both Apache's corporate backers (such as IBM, Intel, Microsoft, Google and others) and interested bystanders (such as Oracle, SAP, HP, RedHat and others).

Apache Harmony wants to create its own licensable Independent Implementations of Java specifications and to permit its downstream users (IBM, Microsoft, Google etc.) to be able to exploit Sun's intellectual property at no cost and with no restrictions. The dispute relates to whether Apache must notify the Downstream Licensees of Apache's Implementations of the consequences, spelled out in 5.E. of the JSPA, of such Licensees' failure to comply with the terms of Sun's licence grant to Apache (*e.g.*, by failing to adhere to the (a – c) requirements). For many reasons, this is a *sui generis* dispute. Sun is not imposing compatibility restrictions on Apache beyond what is provided for in Section 5 of the JSPA. There is no contention that Sun is failing to honour its fair, reasonable and non-discriminatory obligations, or preventing anyone from developing Java-compatible products. In any event, the notification requirement at issue has no application to situations where a licensee wants to incorporate a specification into its own products (*e.g.*, databases or app servers). There is nothing about this dispute that would suggest that Sun's interpretation of the JSPA would, if applied to a dispute with another licensee, permit Sun to abrogate its fair, reasonable and non-discriminatory obligations or otherwise withhold a license to an otherwise compliant licensee based on the nature of the licensee's product. To the extent that Sun's position can be characterized as imposing a "field of use restriction", there is nothing about Sun's position in its dispute with Apache Harmony that would permit it to impose a "field of use restriction" selectively (in violation of its obligations under Section 5) against the products of individual companies (*e.g.*, in a way that would permit Oracle to withhold a commercially reasonable license to use Java in an app server, database or other product).

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- ***The Terms And Implications Of Sun's Current Standalone TCK License Proposal.*** In September 2008, Sun proposed to Apache the following standalone TCK licensing terms for Apache's independent implementation of the Java SE specification, a project named Harmony:

II. Field(s) of Use:

Licensee may only use the TCK licensed hereunder on (a) general purpose servers and (b) general purpose desktop and laptop computers to test Licensee's implementation of the Java SE 6 Specification. Subject to Section IV.A.1 below, You must take reasonable steps to notify downstream licensees of your implementation of the following:

"Any substantive changes to <name of Apache's implementation>, for example, changes to accommodate use on a computing device that is not a general purpose server, desktop or laptop computer, would require that the product be retested against the applicable Java TCK. Apache is unable to grant or otherwise pass through any licenses under Sun's applicable intellectual property rights for downstream products distributed by our licensees and sublicensees and based on or derived from <name of implementation> that do not satisfy all of the following conditions: (i) such products incorporate, in whole or in part, <name of implementation>; (ii) such products themselves satisfy all the other requirements for a Product set forth below; and (iii) such products are branded with the appropriate compliance logo specified by Sun and licensed by Sun to such downstream licensees and sublicensees. A "Product" means an implementation of the Java SE 6 Specification which: (i) fully implements that specification, including all its required interfaces and functionality; (ii) does not modify, subset, superset or otherwise extend the Licensor Name Space, or include any public or protected packages, classes, Java interfaces, fields, methods or constructors within the Licensor Name Space other than those

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required/authorized by the Java SE 6 Specification; (iii) passes the TCK (including satisfying the requirements of the applicable TCK Users Guide) for the Java SE 6 Specification; (iv) has a principal purpose which is substantially different from a stand-alone implementation of that specification, while the value-added portion of the product operates in conjunction with the portion that implements the Java SE 6 Specification; (v) represents a significant functional and value enhancement over any stand-alone implementation of that specification; and (c) is not marketed as a technology which replaces or substitutes for a stand-alone implementation of the Java SE 6 Specification. Licensor Name Space" means the public class or interface declarations whose names begin with "java", "javax", "com.sun" or their equivalents in any subsequent naming convention adopted by Sun through the Java Community Process, or any recognized successors or replacements thereof."

This provision has two operative parts. First, there is a requirement that Harmony only be deployed on general purpose computers (e.g., desktops, laptops and servers) (the "General Purpose Computing Provision"). Second, there is a requirement that Apache notify its downstream Harmony licensees that in order to obtain Sun's IP (including, importantly, the right to call its products 'Java-compatible', the downstream users own modifications to Harmony will have to comply with the JSPA Section 5.B (a—c) specification compatibility requirements ("JSPA Compatibility Provision"). The General Purpose Computing Provision is clearly designed to allow Apache to use Harmony on general purpose computers but not on embedded devices—which is the domain of the Java ME specification. Equally clearly, the JSPA Compatibility Provision is authorized (if not required) by Section 5.E of the JSPA.

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- ***Apache's objections.*** Apache finds both provisions “totally unacceptable,”¹¹⁵ because, in Apache’s view, they are at odds with principles of free and open source software,¹¹⁶ and because “*Sun’s JCK license protects portions of Sun’s commercial Java business at the expense of ASF’s open software.*”¹¹⁷

However, Sun has for many years relied on license restriction to draw boundaries both between platforms (Java SE v. Java ME) and within platforms (Java SE for general computing versus Java SE for embedded use). When Apache embarked on developing its independent implementation of Java SE, Apache was well aware that a standalone Java SE TCK license would come with customary restraints on the field of use. As to the “protection of Sun’s commercial Java business,” the general computing versus embedded computing distinction does indeed separate free from royalty-bearing use. However, Apache has found fault with the fact that Sun has chosen to pursue a mixed strategy of giving its IP away free for general computing uses and charging a royalty for embedded uses and has attempted to cast Sun resistance to relaxing the TCK license requirements of the JSPA as unfair simply because they do not accommodate Apache’s preferences.

- ***Implications of the General Purpose Computing Provision and the JSPA Compatibility provisions.*** To fully appreciate the commercial implications of the TCK license provision at issue, it is helpful to spell out the purposes served by the General Purpose Computing Provision and the JSPA Compatibility provisions.
 - a) ***The General Purpose Computing Provision.*** The General Purpose Computing Provision (i) protects Sun’s ability to charge royalties for Java SE embedded use; (ii) protects Java ME interoperability; and (iii) protects Sun’s ability to charge royalties for Java ME. First some

¹¹⁵ <http://www.apache.org/jcp/sunopenletter.html>

¹¹⁶ <http://www.opensource.org/docs/osd>

¹¹⁷ <http://www.apache.org/jcp/sunopenletter.html>

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background. Sun makes its own Java SE implementation – in source and binary form – available for free for general computing use. For embedded applications, Sun has consistently charged a royalty as part of a commercial license. In addition to licensing Java SE for embedded uses from Sun, anyone is free to create a competing Java SE implementation, either based on the Reference Implementation or as an Independent Implementation, have it pass the TCK test suite, and receive all necessary IP from Sun as the Specification Lead, including copyrights, patents, and Java trademarks. If the competing Java SE is aimed at embedded uses, which is likely, since Sun offers its implementation for general computing purposes at no cost, Sun would receive royalties via the TCK/Reference Implementation license or a standalone TCK license. This has been an entirely uncontroversial mixed free/pay licensing model, characterized by otherwise unremarkable negotiations between licensor and licensees about commercial terms.

Apache's Harmony project is specifically designed to undermine Sun's ability to collect royalties via the TCK license and, by implication, via a commercial license for Java SE for embedded use. Harmony is a clean room implementation of Java SE; in other words, a true Java SE clone. In order to receive the Sun copyrights (to the extent required), patents, and trademarks, Harmony has to pass the TCK. Assuming that Apache is a Qualified Not-for-Profit organization, it is entitled to a royalty free standalone TCK license under Section 5.F.III of the JSPA. The problem – for Sun – is that once Sun's Java IP flows to non-profit Apache, Apache can and will distributed Harmony to all of Sun's *for profit* licensees (such as IBM, Microsoft, Intel and Google) at no charge under the terms of the Apache License, which is the "corporate friendly" open source license. The Apache License grants a "perpetual, worldwide, nonexclusive, no-charge, royalty-free, irrevocable ... patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the

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Work”¹¹⁸ for any personal or commercial purpose. Licensees would turn to Harmony with no ability for Sun to recover any of the lost license revenues from Apache via a TCK license. In short, were Apache’s position to prevail, it would effectively result in the not-for-profit benefits offered by Sun being conferred upon for profit commercial licensees, destroying Sun’s Java SE revenue model in the process.

For that reason, Sun has resisted the pressure to relax the General Purpose Computing Provision that it imposes on all of its commercial licensees on Apache. Since every single one of Sun’s Java SE licensees who is licensed for embedded use is required to pay a fee, Sun’s refusal to grant Apache a royalty-free license is not discriminatory. It is Apache (undoubtedly at least in part on behalf of its commercial backers) who is asking for something that other licensees don’t get, namely a royalty-free license for embedded use.

In addition to protecting Sun’s mixed free/pay licensing model for Java SE, the General Purpose Computing Provision also protects Java ME interoperability and Sun’s ability to charge royalties for Java ME. The reasoning is straightforward. Java ME has never been available for free. If Harmony as a royalty-free version of Java SE for embedded use were available, Java device manufacturers such as cell-phone makers would have a strong incentive to install a modified version of Harmony/Java SE on their devices in lieu of Java ME. Since Harmony/Java SE and Java ME are not compatible, the Java standard for embedded devices would fracture. Presently, vendors of mobile Java applications can be certain that Java ME – *and only Java ME* – will be installed on a Java-enabled mobile device. The vendor can thus write its application once and run it on every Java mobile device. If some mobile devices were to migrate to Java SE/Harmony instead, the standard (along with Sun’s ability to charge for Java ME) would be compromised.

¹¹⁸ Apache License Version 2.0, January 2004, available at <http://www.apache.org/licenses/LICENSE-2.0.txt>.

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b) *The JSPA Compatibility Provision.* The JSPA compatibility provision is a nonfragmentation requirement to protect the integrity of the Java SE platform.¹¹⁹ Here, the issue is not Apache's status as a Qualified Not-for-Profit organization but the terms of the downstream Apache License. Apache licensees can "reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form" as long as a copy of the License is provided, notice is provided to recipients of the work that the files were modified, and all intellectual property attributions are included in the source form of the work. The terms of the Apache License therefore do not preclude downstream Apache users – including Microsoft, IBM, Google, Oracle, SAP, RedHat and others – from using the Harmony code to create incompatible implementations of Java SE. The result would be precisely what led the D.C. Circuit Court of Appeals to condemn Microsoft's "embrace, extend, extinguish" strategy vis-à-vis Java, namely that "developers who were opting for portability over performance ... unwittingly [wrote] Java applications that [ran] only on Windows."¹²⁰ The proliferation of incompatible Java look-alikes would result in the fragmenting of Java SE, both in general computing and in embedded environments, to the detriment of application developers and of Sun as the Java SE licensor.

- o *Conclusion on the Apache licensing dispute.* The Harmony dispute is entirely unrelated to the proposed acquisition. It is a commercial dispute between Sun on the one hand and Apache on the other. As indicated above, Apache is supported by its for-profit backers and those who stand to receive a windfall in the form of a royalty-free Java SE embedded license if Apache gets its wish. However, some of Apache's supporters are conflicted, because they are concerned with the prospect of Java SE and Java ME fragmentation. Shifting alliances, opportunistic behaviour and relatively evenly distributed claims to high principles, all made visible as a result of the transparency

¹¹⁹ Integrity of the platform means that every implementation of a Java Platform specification must provide a complete and exact match with the specification providing neither a subset nor a superset of the specification and the implementation is used in compliance with the terms under which it was licensed. See Section 5.B (a – c).

¹²⁰ *U.S. v. Microsoft Corp.* 253 F.3d 34, 76 (D.C. Cir. 2001).

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requirements of the JCP, make this dispute a long-running favourite of technology reporting. Those concerned that the Harmony dispute is somehow representative of potential future problems should take comfort in the fact that, as discussed above, the JCP provides all but ironclad safeguards against any abuse of the limited flexibility that is built into the commercial terms of TCK licensing.¹²¹ Version 2.7 of the Process has further strengthened the transparency requirements¹²² and once apprised of a proposed discriminatory TCK license structure, or even a single incident where one *sui generis* licensee complains publicly about an allegedly discriminatory practice, self-help is readily available to the Executive Committee members. As discussed above in detail, there is no practical way for Sun/Oracle to discriminate against individual rivals. As a result of the unique nature of the dispute, the Harmony controversy does not serve as an illustration of strategic downstream licensing restrictions in applications or middleware. To the contrary, Java influences downstream markets only in a positive way *because, by its nature, it promotes interoperability*. Since Oracle cannot do anything to deny full interoperability to downstream rivals without negating the Specification itself, which is the source of all interoperability protocols, the set of plausible anticompetitive strategies is null.

C. OTHER THAN AFFECTED RELEVANT MARKETS

173. As noted above, middleware, server operating systems and databases could be viewed to be "other than affected markets" as defined by the Form CO.
174. Information on the middleware segment has already been provided above at paragraphs 93 *et seq.*
175. In what follows, further information on the server operating systems and server hardware markets is first provided, followed by an explanation of why Oracle lacks the ability and incentive to attempt to increase its market share

¹²¹ There is no flexibility with regard to compatibility requirements. see Section 5.F.IV.

¹²² See http://jcp.org/en/press/news/JCP2_7_transparent: "In the interest of making every aspect of the program more transparent, Expert Groups must fully disclose the licensing terms for the specification, Reference Implementation (RI), and Technology Compatibility Kit (TCK)."